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Shigetomi

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(45) **Date of Patent: Oct. 11, 2016**

(54) **DISPLAY INPUT APPARATUS AND COMPUTER-READABLE NON-TRANSITORY RECORDING MEDIUM WITH DISPLAY INPUT CONTROL PROGRAM RECORDED THEREON**

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(22) Filed: **Oct. 14, 2015**

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(51) **Int. Cl.**

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G06F 3/0488	(2013.01)
G06F 3/12	(2006.01)
G06F 3/0482	(2013.01)
G06F 3/0484	(2013.01)

(52) **U.S. Cl.**

CPC ***H04N 1/00973*** (2013.01); ***G06F 3/0482*** (2013.01); ***G06F 3/0488*** (2013.01); ***G06F 3/04847*** (2013.01); ***G06F 3/04883*** (2013.01); ***G06F 3/1203*** (2013.01); ***H04N 1/00307*** (2013.01); ***H04N 1/00392*** (2013.01); ***H04N 1/00493*** (2013.01); *H04N 2201/0094* (2013.01)

(58) **Field of Classification Search**

None

See application file for complete search history.

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Primary Examiner — Andrew H Lam

(74) *Attorney, Agent, or Firm* — IP Business Solutions, LLC

(57) **ABSTRACT**

A display input apparatus includes a display section, a touch panel, a gesture acceptance section, a display control section, a job generating section, a communication section, and a communication control section. The job generating section is configured to, when a slide gesture in a predetermined first direction is made on a candidate image, generate an image formation job based on a piece of data represented by the candidate image. The display control section is configured to, when the slide gesture in the first direction is made on the candidate image, allow the display section to display a pending image indicating a piece of data pending on an image forming apparatus and thereafter, when the communication section receives a report indicating a completion of the image formation job, allow the display section to eliminate the display of the pending image.

11 Claims, 17 Drawing Sheets

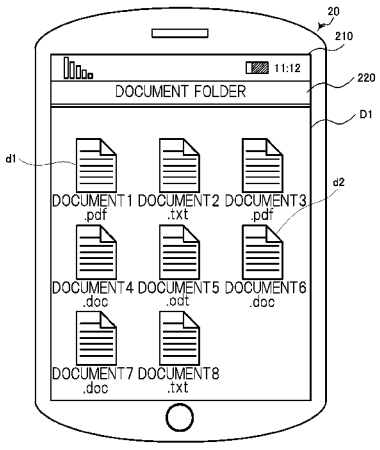


Fig.1

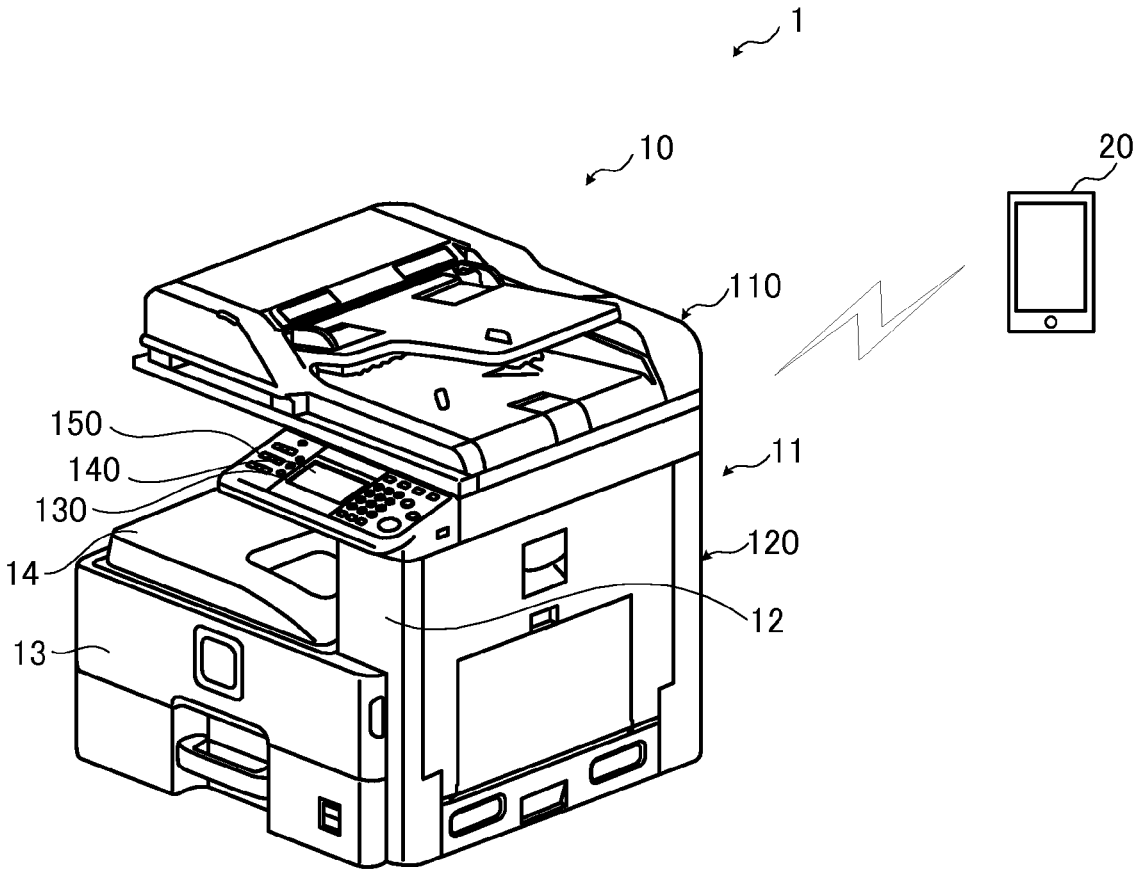


Fig.2

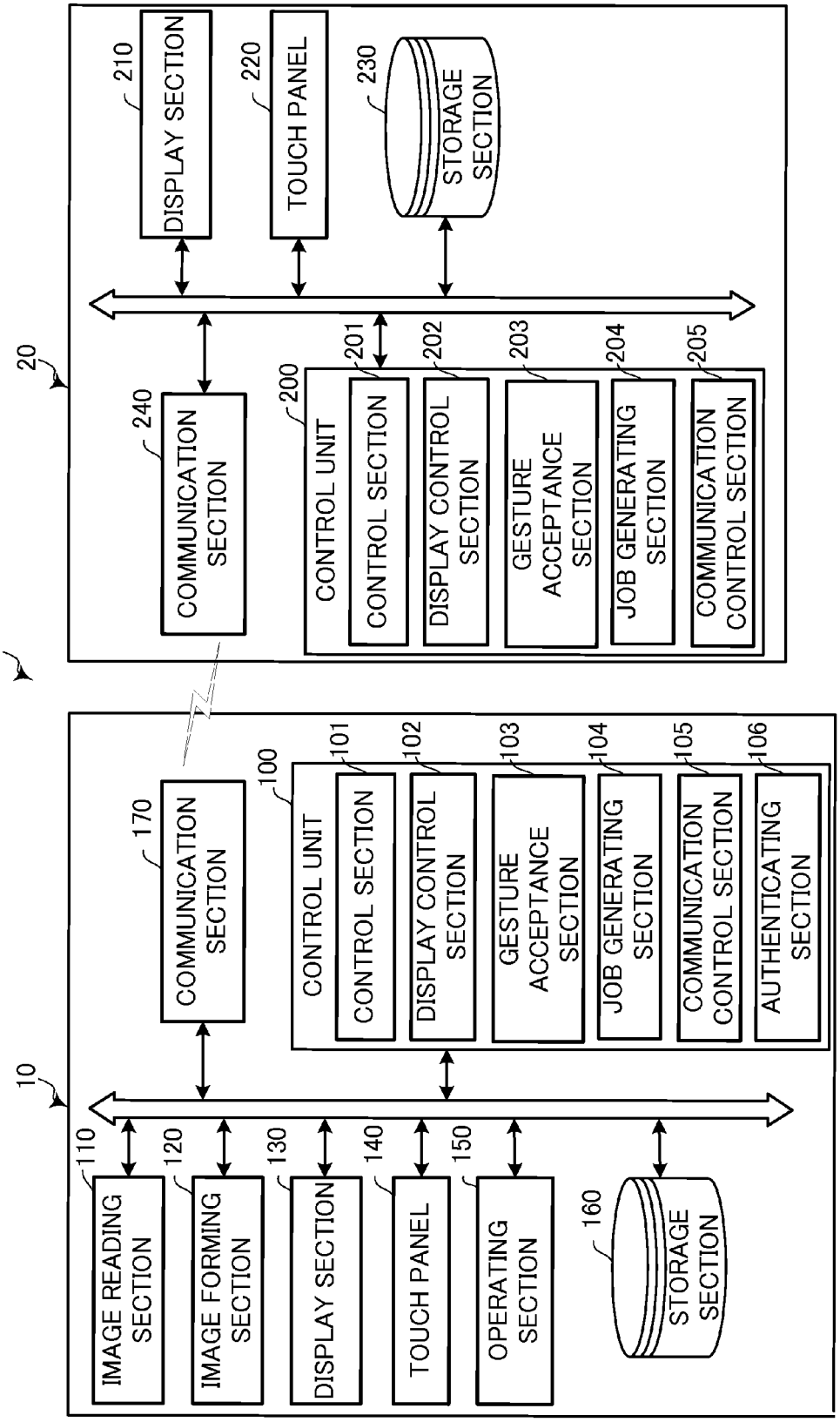

1
10
IMAGE READING SECTION
110
IMAGE FORMING SECTION
120
DISPLAY SECTION
130
TOUCH PANEL
140
OPERATING SECTION
150
STORAGE SECTION
160
COMMUNICATION SECTION
170
CONTROL UNIT
100
CONTROL SECTION
101
DISPLAY CONTROL SECTION
102
GESTURE ACCEPTANCE SECTION
103
JOB GENERATING SECTION
104
COMMUNICATION CONTROL SECTION
105
AUTHENTICATING SECTION
106
20
DISPLAY SECTION
210
TOUCH PANEL
220
STORAGE SECTION
230
COMMUNICATION SECTION
240
CONTROL UNIT
200
CONTROL SECTION
201
DISPLAY CONTROL SECTION
202
GESTURE ACCEPTANCE SECTION
203
JOB GENERATING SECTION
204
COMMUNICATION CONTROL SECTION
205

Fig.3

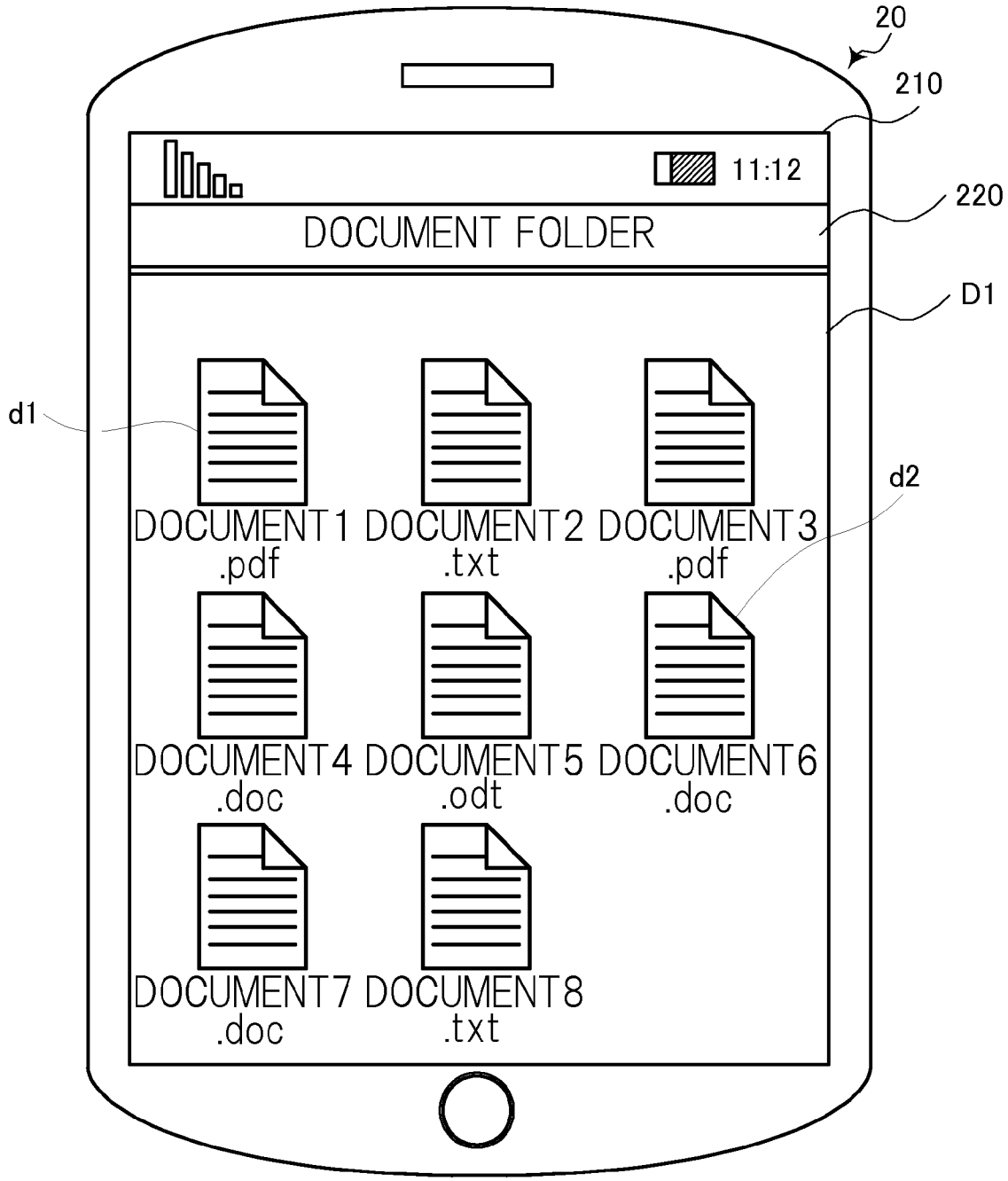

20
210
11:12
220
DOCUMENT FOLDER
D1
d1
d2
DOCUMENT1
.pdf
DOCUMENT2
.txt
DOCUMENT3
.pdf
DOCUMENT4
.doc
DOCUMENT5
.odt
DOCUMENT6
.doc
DOCUMENT7
.doc
DOCUMENT8
.txt

Fig.4

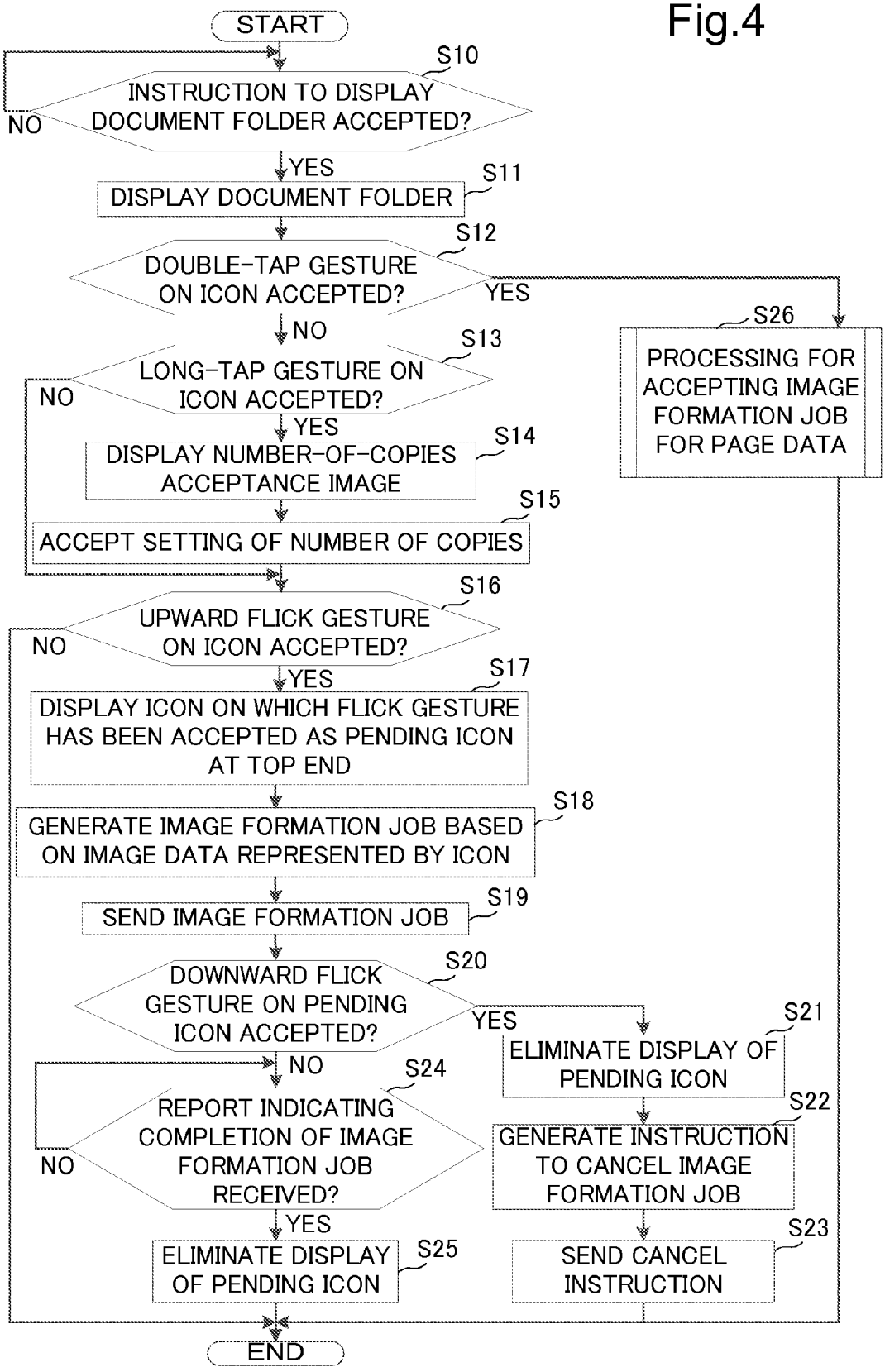

START
S10
INSTRUCTION TO DISPLAY DOCUMENT FOLDER ACCEPTED?
NO
YES
S11
DISPLAY DOCUMENT FOLDER
S12
DOUBLE-TAP GESTURE ON ICON ACCEPTED?
YES
S26
PROCESSING FOR ACCEPTING IMAGE FORMATION JOB FOR PAGE DATA
NO
S13
LONG-TAP GESTURE ON ICON ACCEPTED?
NO
YES
S14
DISPLAY NUMBER-OF-COPIES ACCEPTANCE IMAGE
S15
ACCEPT SETTING OF NUMBER OF COPIES
S16
UPWARD FLICK GESTURE ON ICON ACCEPTED?
NO
YES
S17
DISPLAY ICON ON WHICH FLICK GESTURE HAS BEEN ACCEPTED AS PENDING ICON AT TOP END
S18
GENERATE IMAGE FORMATION JOB BASED ON IMAGE DATA REPRESENTED BY ICON
S19
SEND IMAGE FORMATION JOB
S20
DOWNWARD FLICK GESTURE ON PENDING ICON ACCEPTED?
YES
S21
ELIMINATE DISPLAY OF PENDING ICON
S22
GENERATE INSTRUCTION TO CANCEL IMAGE FORMATION JOB
S23
SEND CANCEL INSTRUCTION
NO
S24
REPORT INDICATING COMPLETION OF IMAGE FORMATION JOB RECEIVED?
NO
YES
S25
ELIMINATE DISPLAY OF PENDING ICON
END

Fig.5

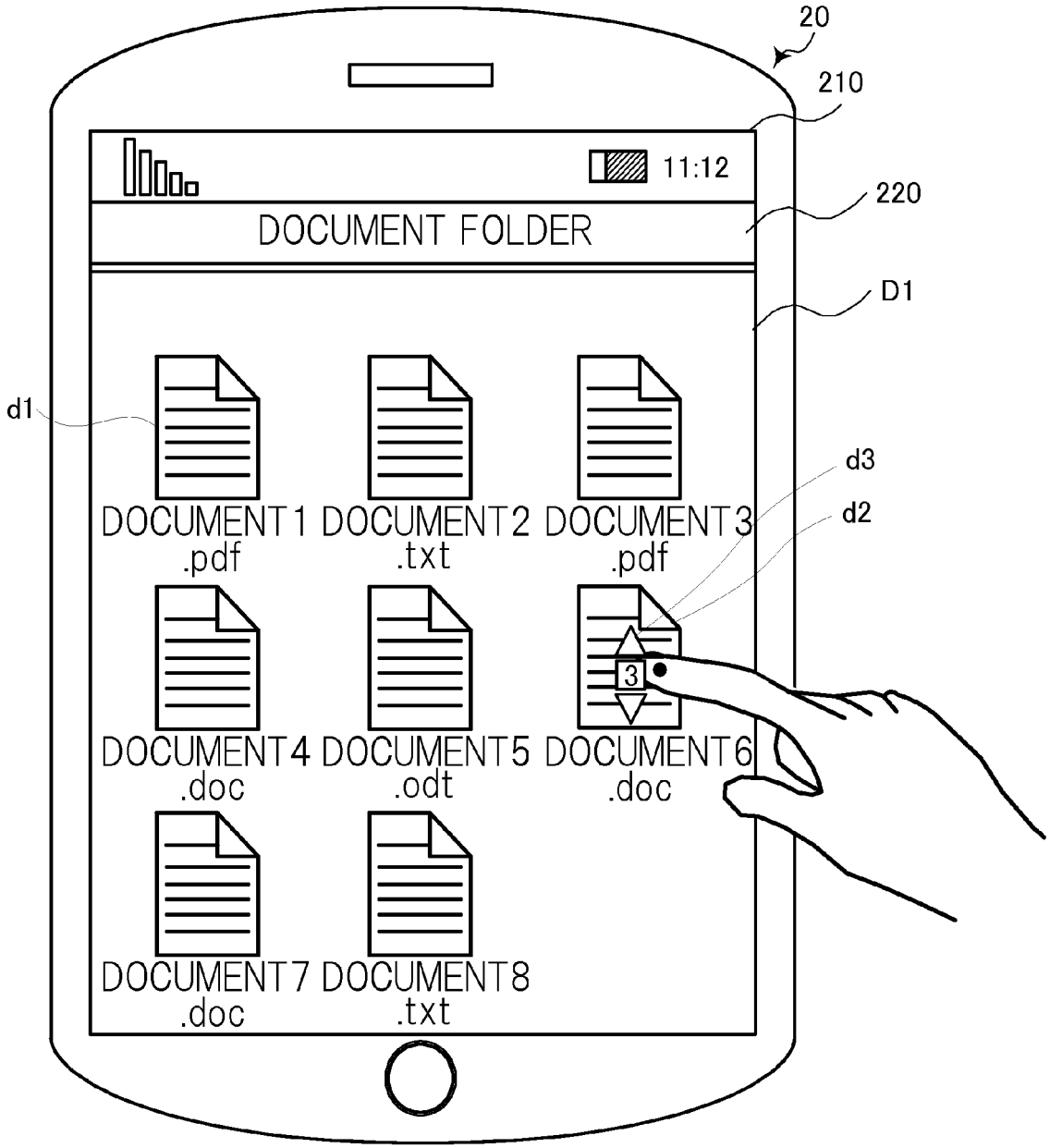
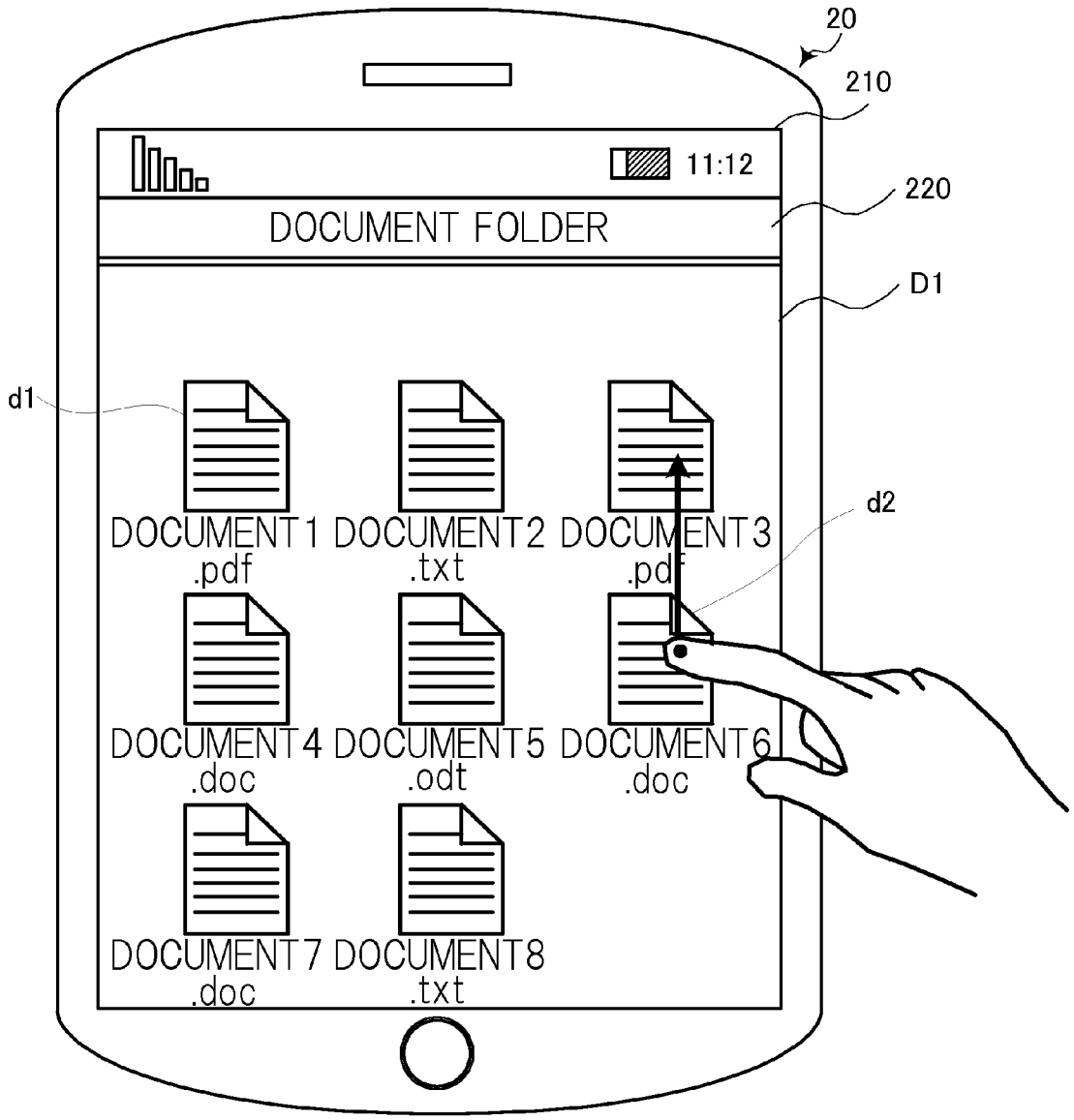

20
210
11:12
220
DOCUMENT FOLDER
D1
d1
d3
d2
DOCUMENT1 .pdf
DOCUMENT2 .txt
DOCUMENT3 .pdf
DOCUMENT4 .doc
DOCUMENT5 .odt
DOCUMENT6 .doc
DOCUMENT7 .doc
DOCUMENT8 .txt

Fig.6A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210
11:12
220
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D1
d1
DOCUMENT1 .pdf
DOCUMENT2 .txt
DOCUMENT3 .pdf
d2
DOCUMENT4 .doc
DOCUMENT5 .odt
DOCUMENT6 .doc
DOCUMENT7 .doc
DOCUMENT8 .txt

Fig.6B

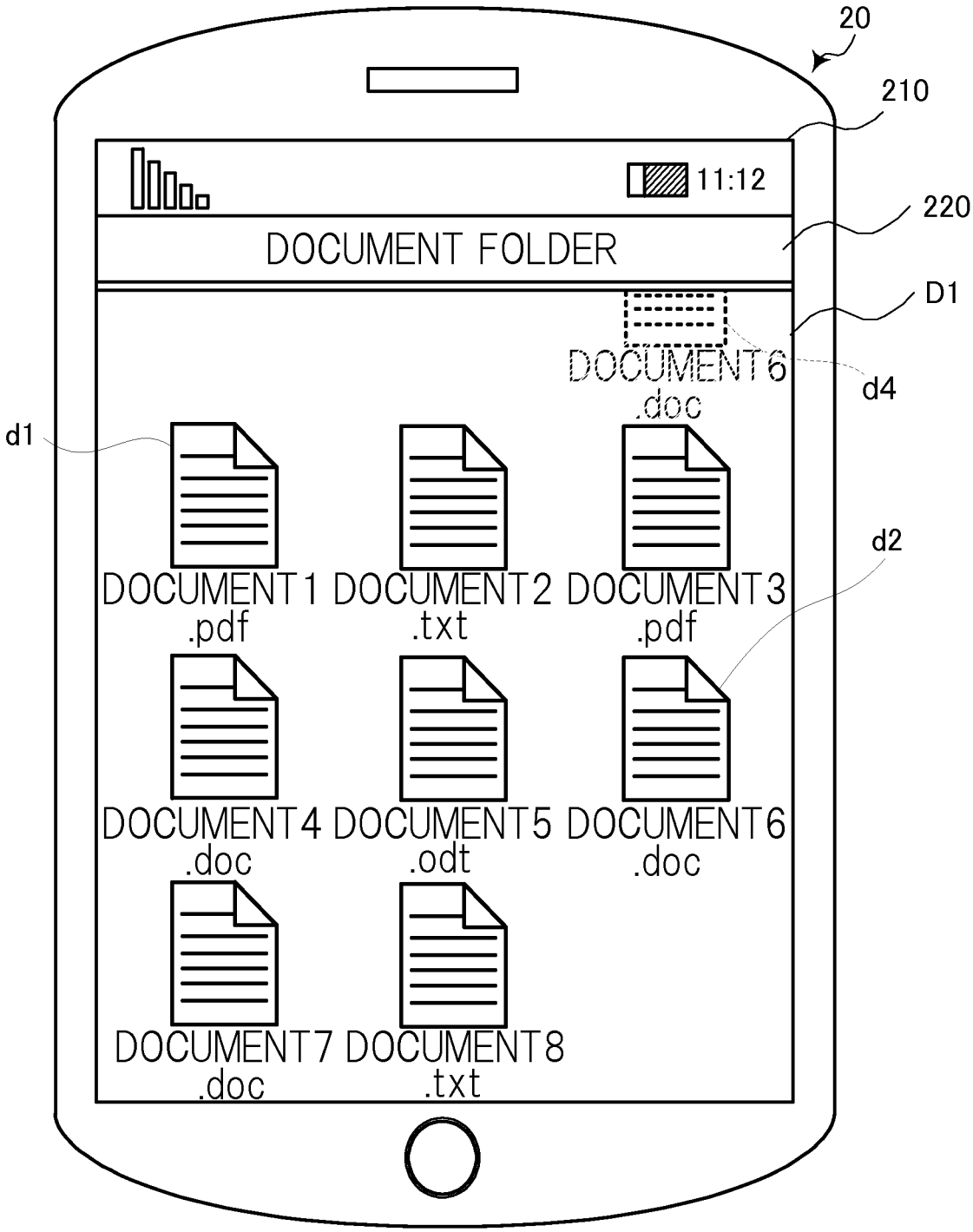

20
210
11:12
220
DOCUMENT FOLDER
D1
DOCUMENT6
.doc
d4
d1
d2
DOCUMENT1
.pdf
DOCUMENT2
.txt
DOCUMENT3
.pdf
DOCUMENT4
.doc
DOCUMENT5
.odt
DOCUMENT6
.doc
DOCUMENT7
.doc
DOCUMENT8
.txt

Fig.7A

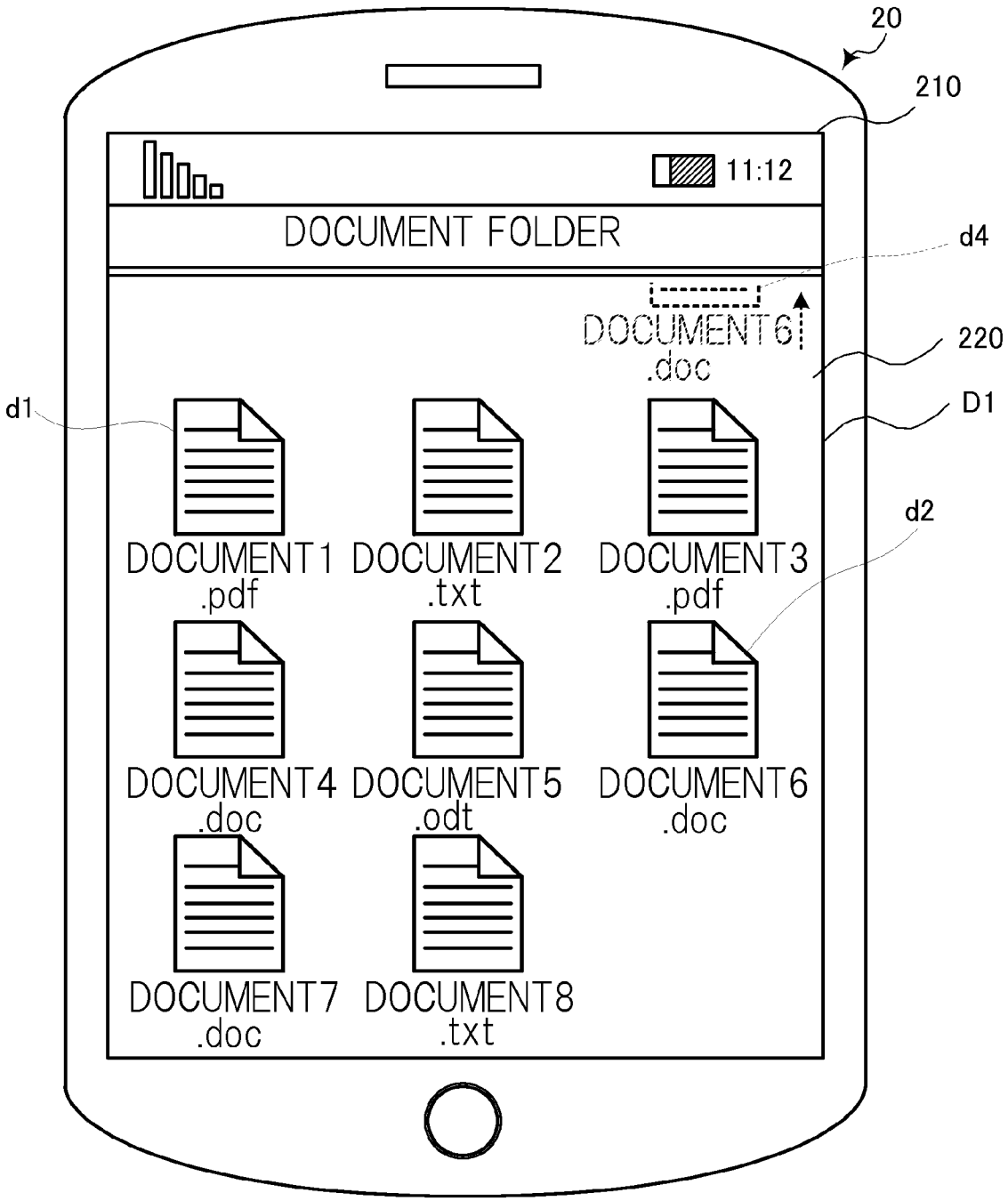
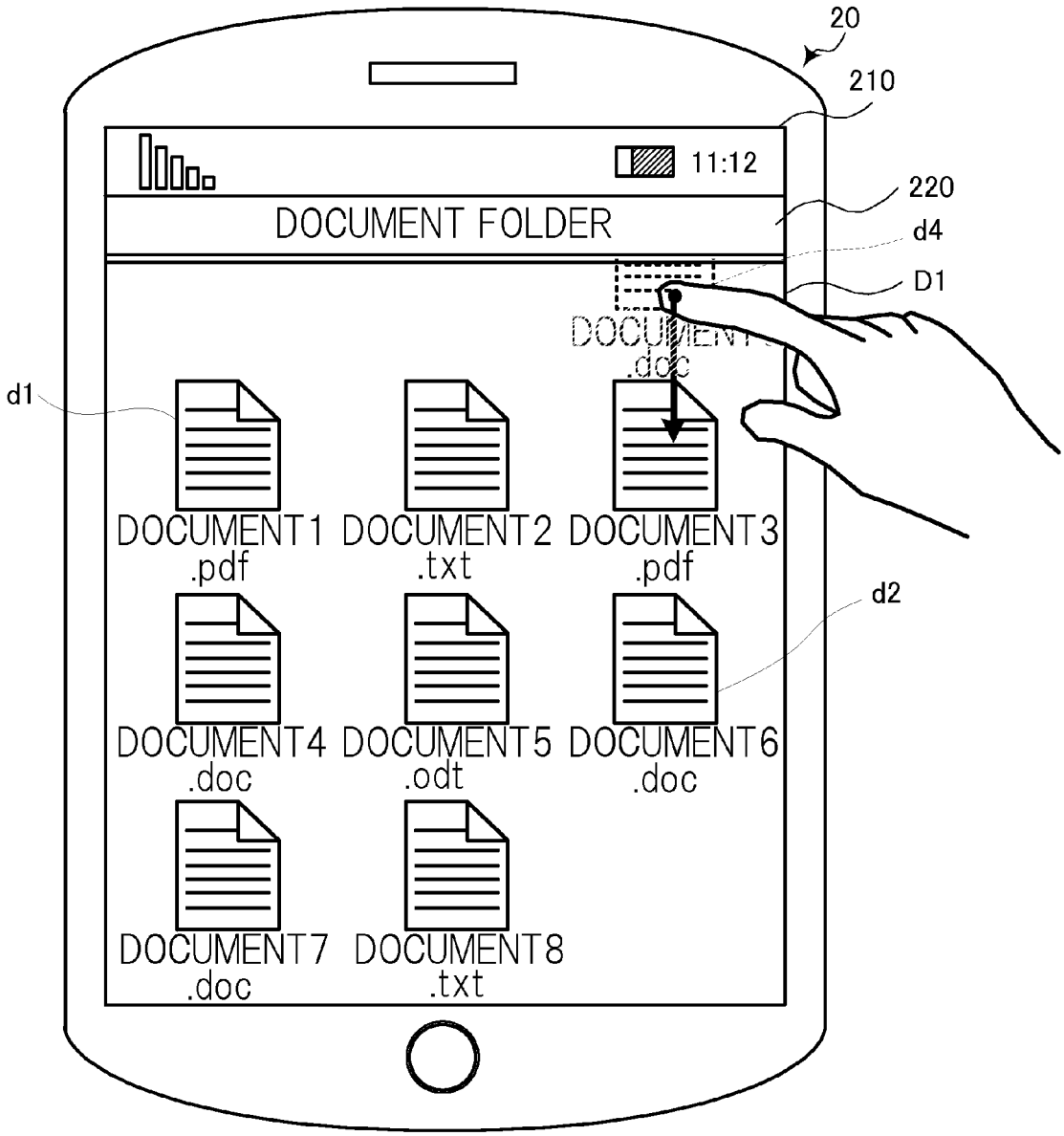

20
210
11:12
DOCUMENT FOLDER
d4
DOCUMENT6
.doc
220
d1
D1
d2
DOCUMENT1
.pdf
DOCUMENT2
.txt
DOCUMENT3
.pdf
DOCUMENT4
.doc
DOCUMENT5
.odt
DOCUMENT6
.doc
DOCUMENT7
.doc
DOCUMENT8
.txt

Fig.7B


20
210
11:12
220
DOCUMENT FOLDER
d4
D1
.doc
d1
DOCUMENT1
.pdf
DOCUMENT2
.txt
DOCUMENT3
.pdf
d2
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.doc
DOCUMENT5
.odt
DOCUMENT6
.doc
DOCUMENT7
.doc
DOCUMENT8
.txt

Fig.8

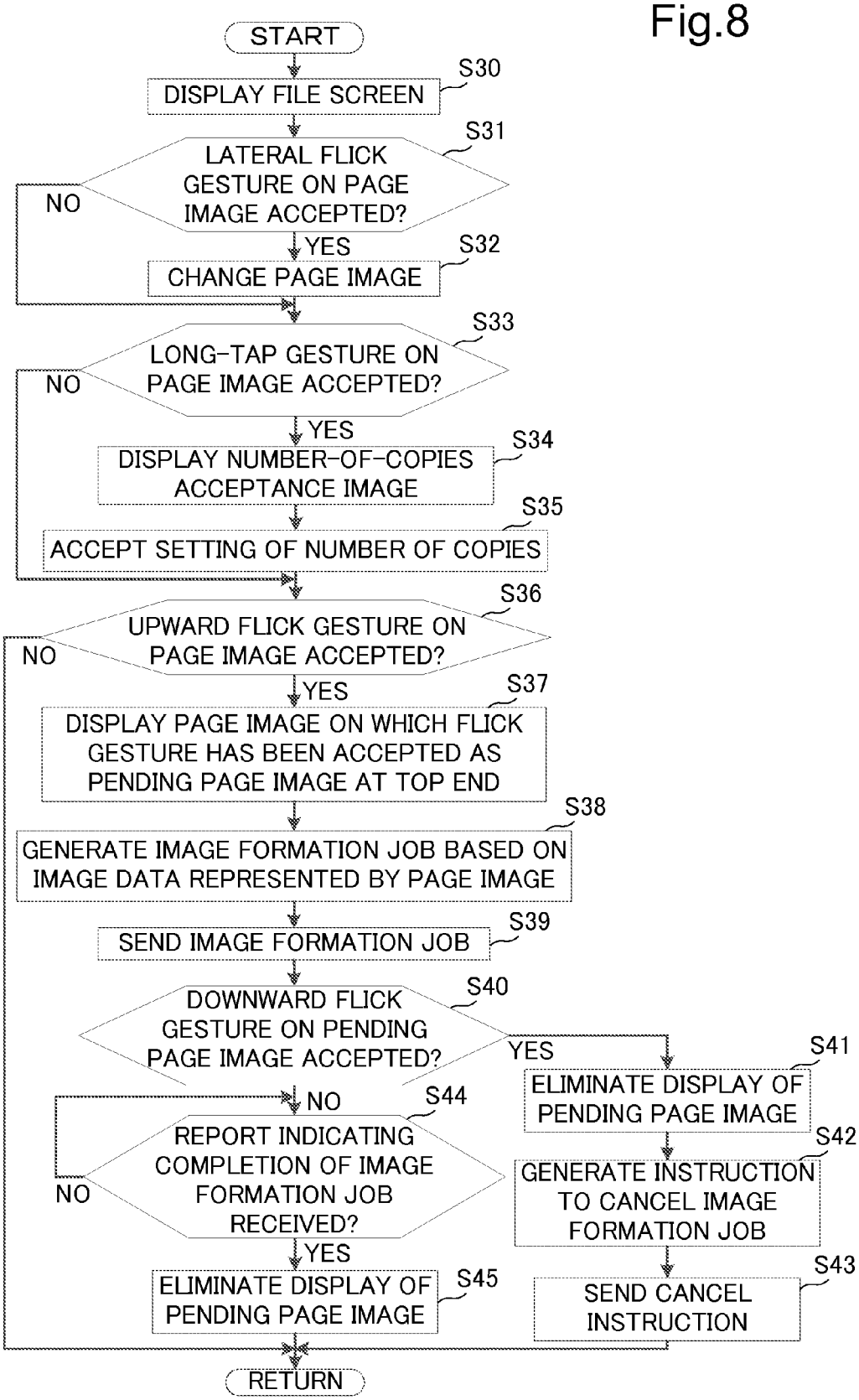

START
S30
DISPLAY FILE SCREEN
S31
LATERAL FLICK GESTURE ON PAGE IMAGE ACCEPTED?
NO
YES
S32
CHANGE PAGE IMAGE
S33
LONG-TAP GESTURE ON PAGE IMAGE ACCEPTED?
NO
YES
S34
DISPLAY NUMBER-OF-COPIES ACCEPTANCE IMAGE
S35
ACCEPT SETTING OF NUMBER OF COPIES
S36
UPWARD FLICK GESTURE ON PAGE IMAGE ACCEPTED?
NO
YES
S37
DISPLAY PAGE IMAGE ON WHICH FLICK GESTURE HAS BEEN ACCEPTED AS PENDING PAGE IMAGE AT TOP END
S38
GENERATE IMAGE FORMATION JOB BASED ON IMAGE DATA REPRESENTED BY PAGE IMAGE
S39
SEND IMAGE FORMATION JOB
S40
DOWNWARD FLICK GESTURE ON PENDING PAGE IMAGE ACCEPTED?
YES
S41
ELIMINATE DISPLAY OF PENDING PAGE IMAGE
S42
GENERATE INSTRUCTION TO CANCEL IMAGE FORMATION JOB
S43
SEND CANCEL INSTRUCTION
NO
S44
REPORT INDICATING COMPLETION OF IMAGE FORMATION JOB RECEIVED?
NO
YES
S45
ELIMINATE DISPLAY OF PENDING PAGE IMAGE
RETURN

Fig.9A

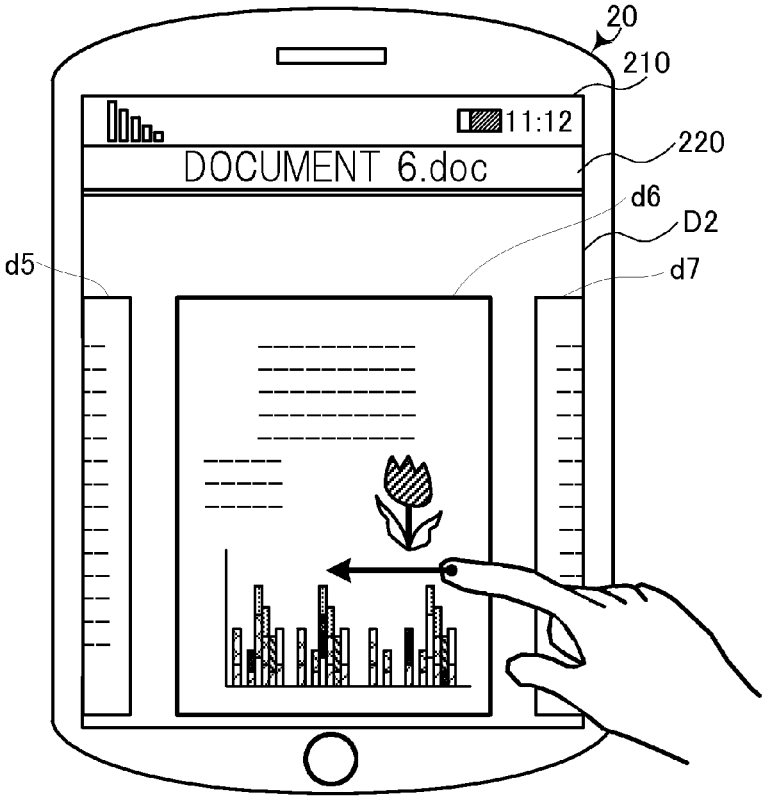

20
210
11:12
220
DOCUMENT 6.doc
d6
D2
d5
d7

Fig.9B

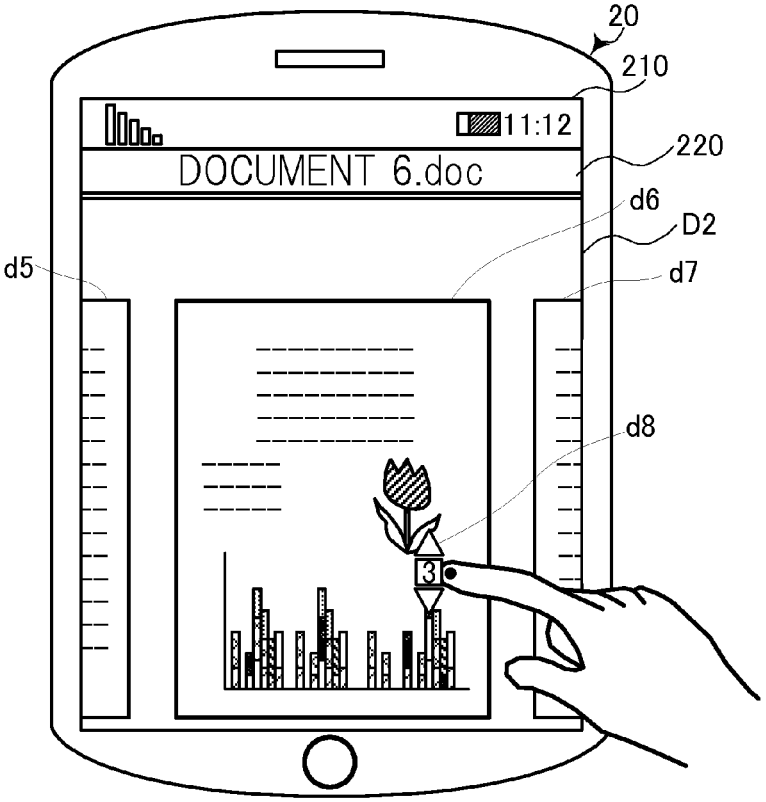

20
210
11:12
220
DOCUMENT 6.doc
d6
D2
d5
d7
d8

Fig.10A

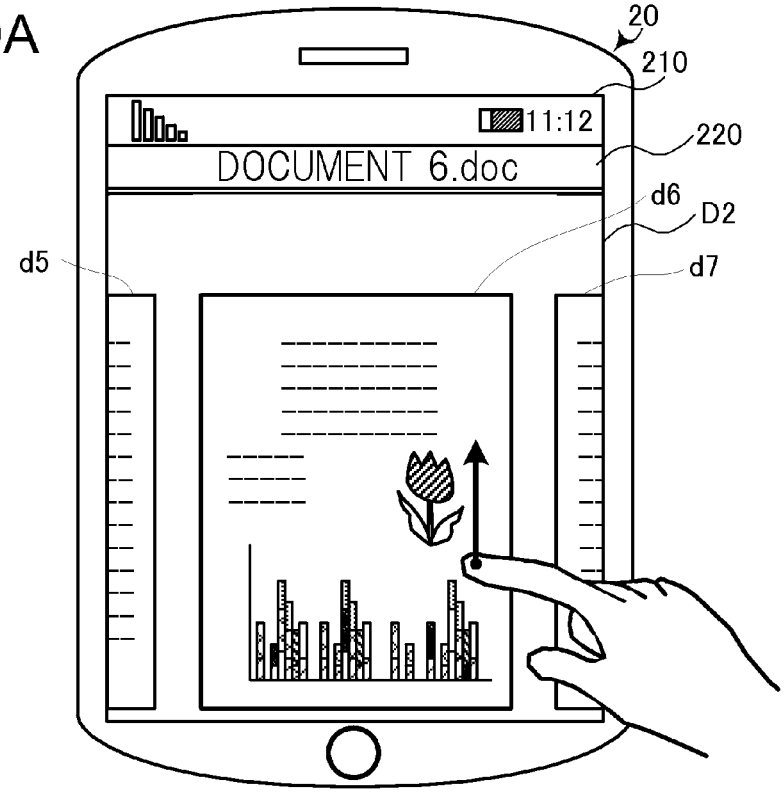


Fig.10B

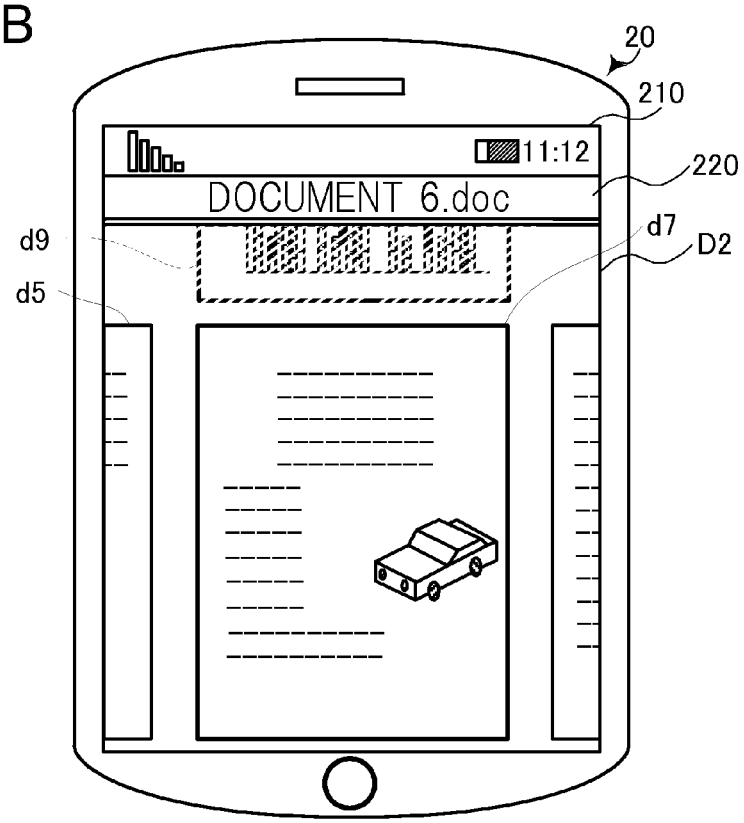


Fig.11A

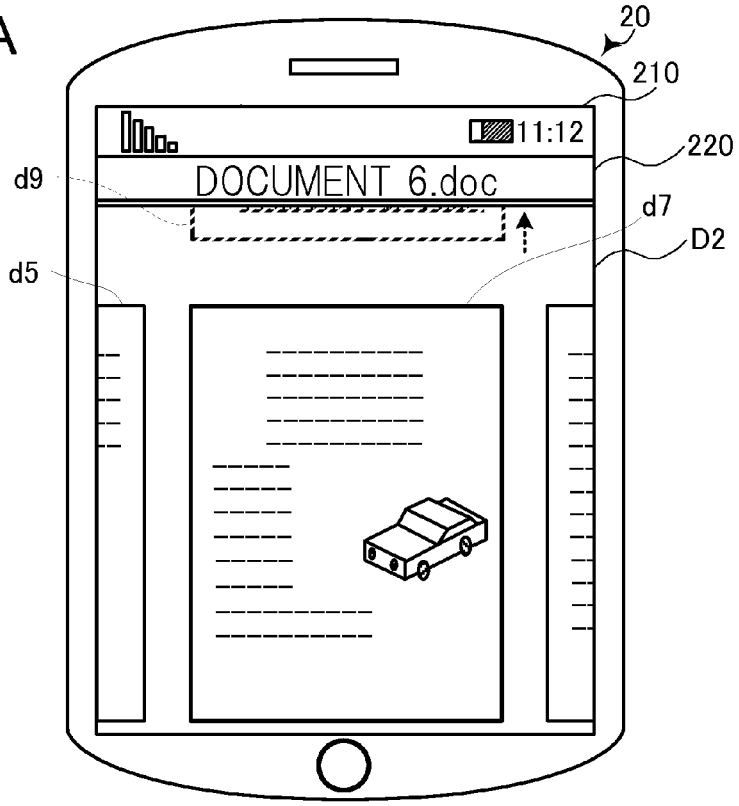


Fig.11B

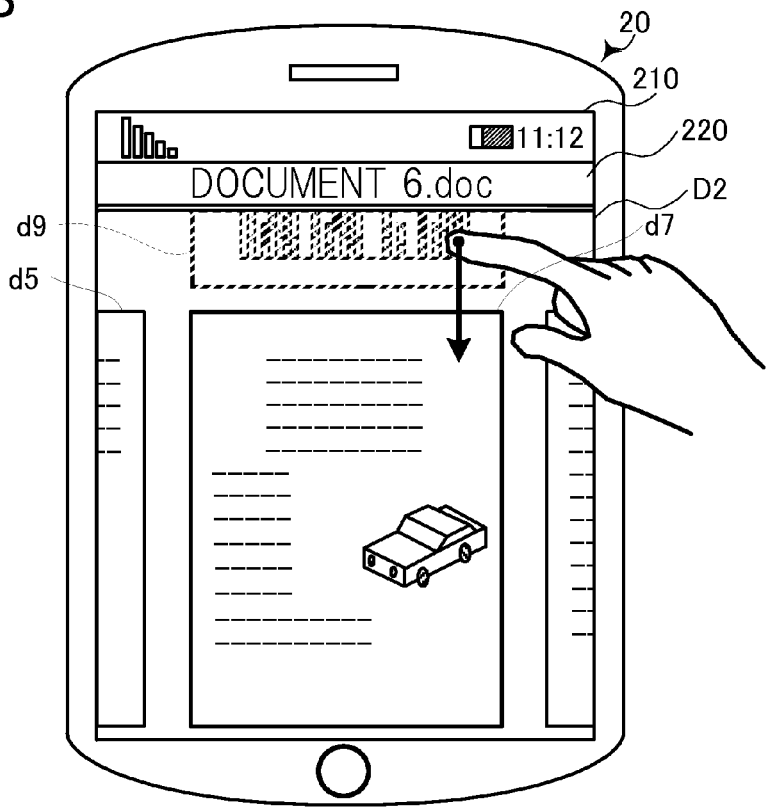


Fig.12A

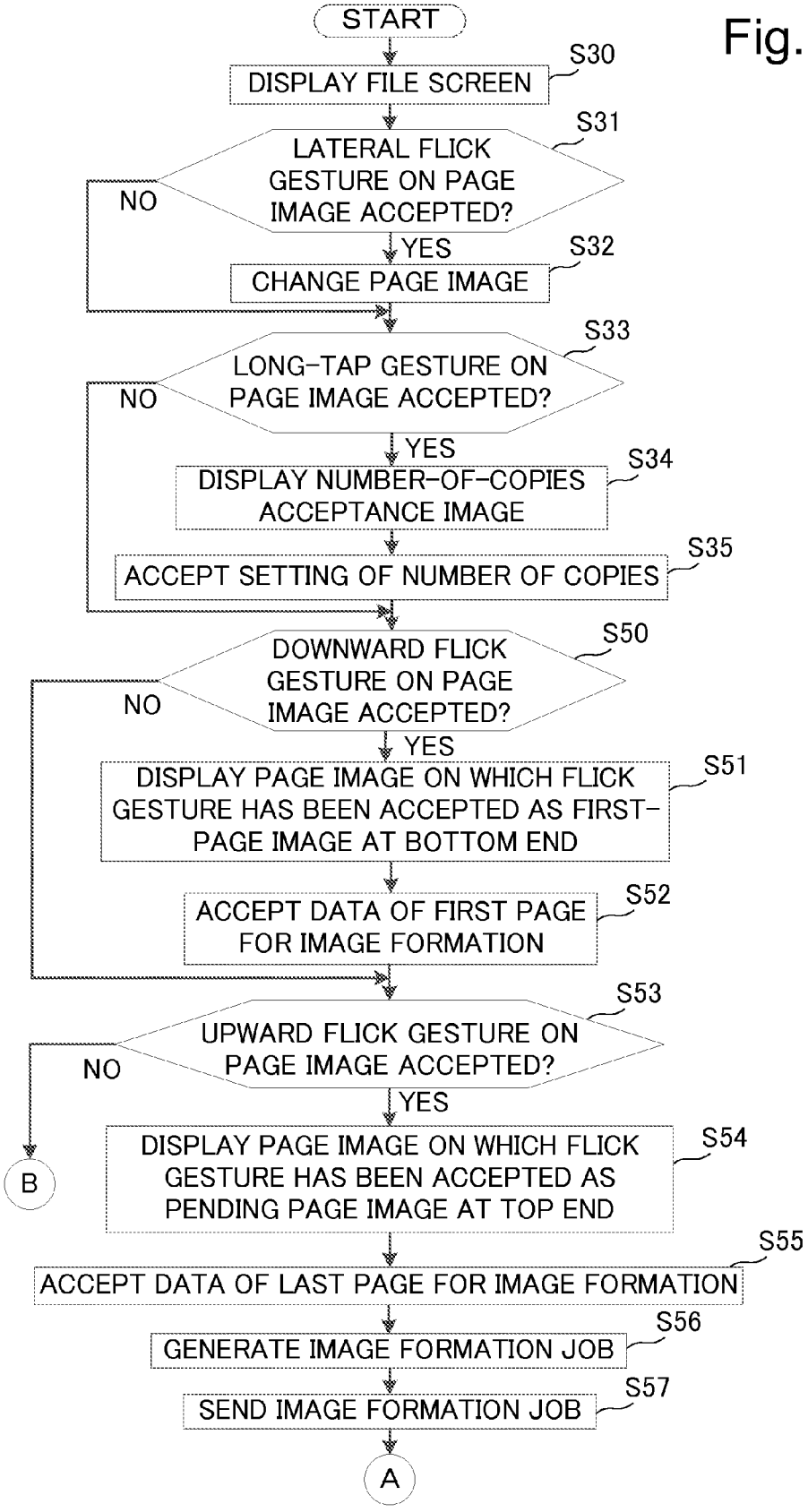

START
DISPLAY FILE SCREEN
S30
LATERAL FLICK GESTURE ON PAGE IMAGE ACCEPTED?
S31
NO
YES
CHANGE PAGE IMAGE
S32
LONG-TAP GESTURE ON PAGE IMAGE ACCEPTED?
S33
NO
YES
DISPLAY NUMBER-OF-COPIES ACCEPTANCE IMAGE
S34
ACCEPT SETTING OF NUMBER OF COPIES
S35
DOWNWARD FLICK GESTURE ON PAGE IMAGE ACCEPTED?
S50
NO
YES
DISPLAY PAGE IMAGE ON WHICH FLICK GESTURE HAS BEEN ACCEPTED AS FIRST-PAGE IMAGE AT BOTTOM END
S51
ACCEPT DATA OF FIRST PAGE FOR IMAGE FORMATION
S52
UPWARD FLICK GESTURE ON PAGE IMAGE ACCEPTED?
S53
NO
YES
B
DISPLAY PAGE IMAGE ON WHICH FLICK GESTURE HAS BEEN ACCEPTED AS PENDING PAGE IMAGE AT TOP END
S54
ACCEPT DATA OF LAST PAGE FOR IMAGE FORMATION
S55
GENERATE IMAGE FORMATION JOB
S56
SEND IMAGE FORMATION JOB
S57
A

Fig.12B

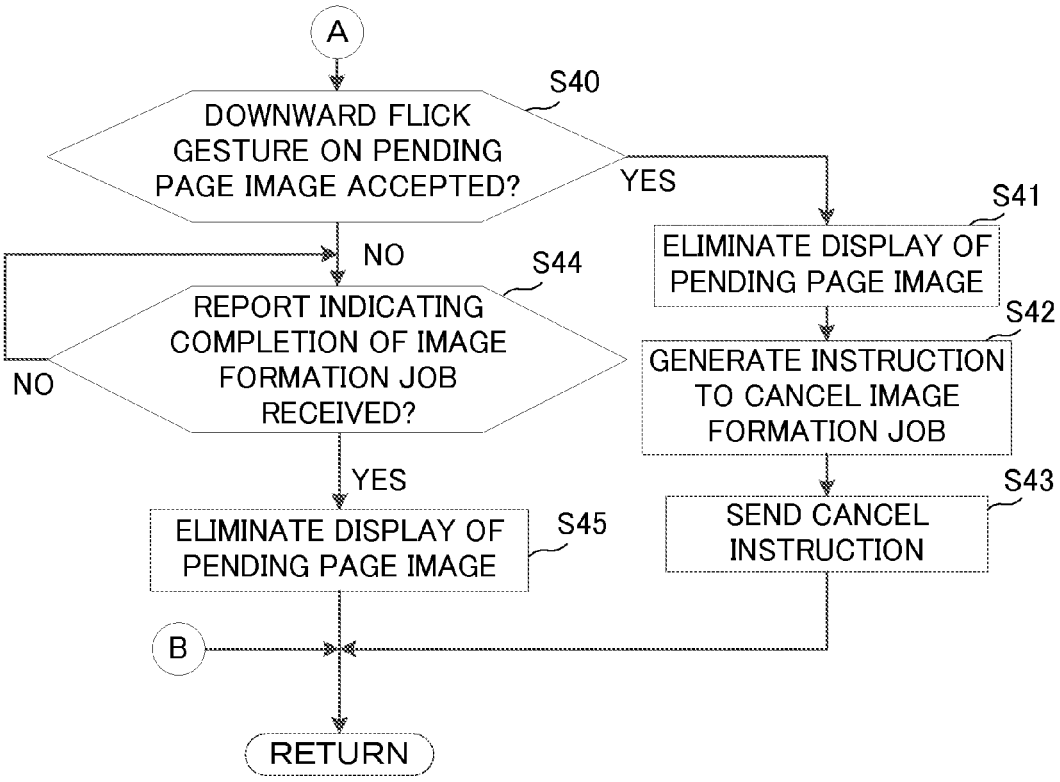

A
S40
DOWNWARD FLICK GESTURE ON PENDING PAGE IMAGE ACCEPTED?
YES
NO
S41
ELIMINATE DISPLAY OF PENDING PAGE IMAGE
S44
REPORT INDICATING COMPLETION OF IMAGE FORMATION JOB RECEIVED?
NO
S42
GENERATE INSTRUCTION TO CANCEL IMAGE FORMATION JOB
YES
S43
SEND CANCEL INSTRUCTION
S45
ELIMINATE DISPLAY OF PENDING PAGE IMAGE
B
RETURN

Fig.13A

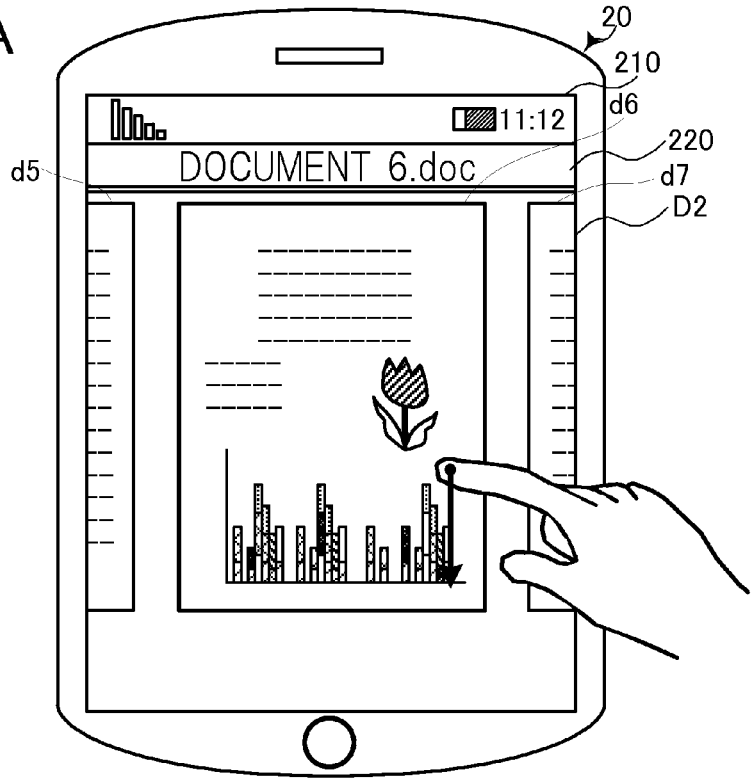


Fig.13B

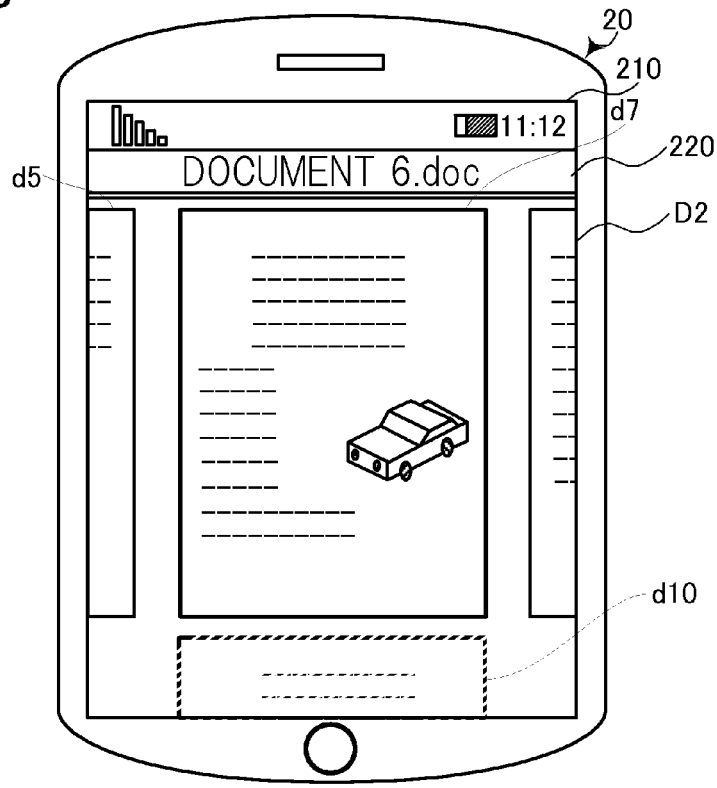


Fig.14A

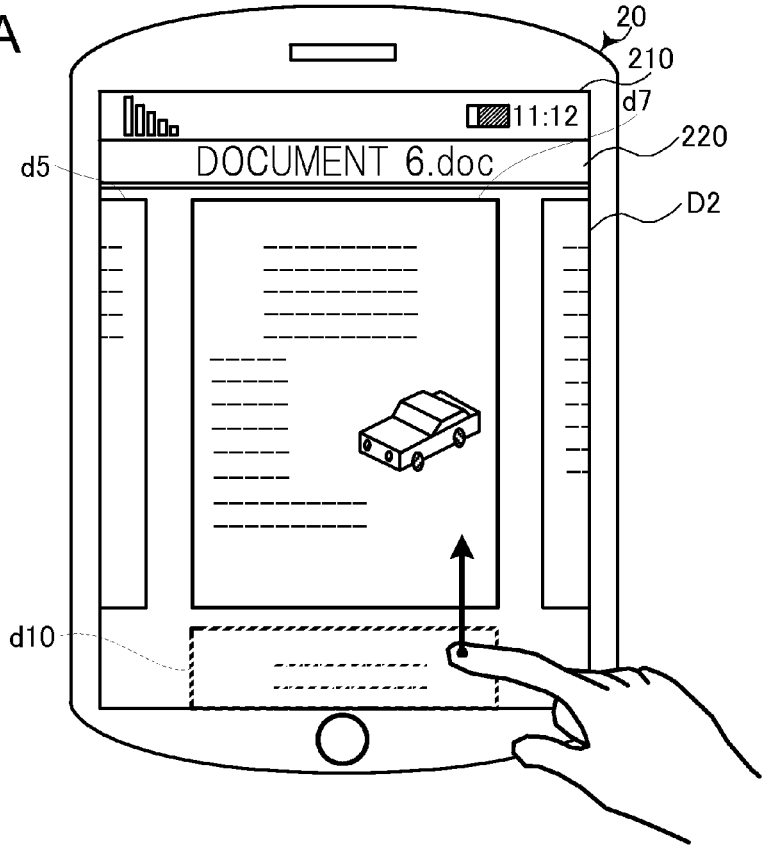
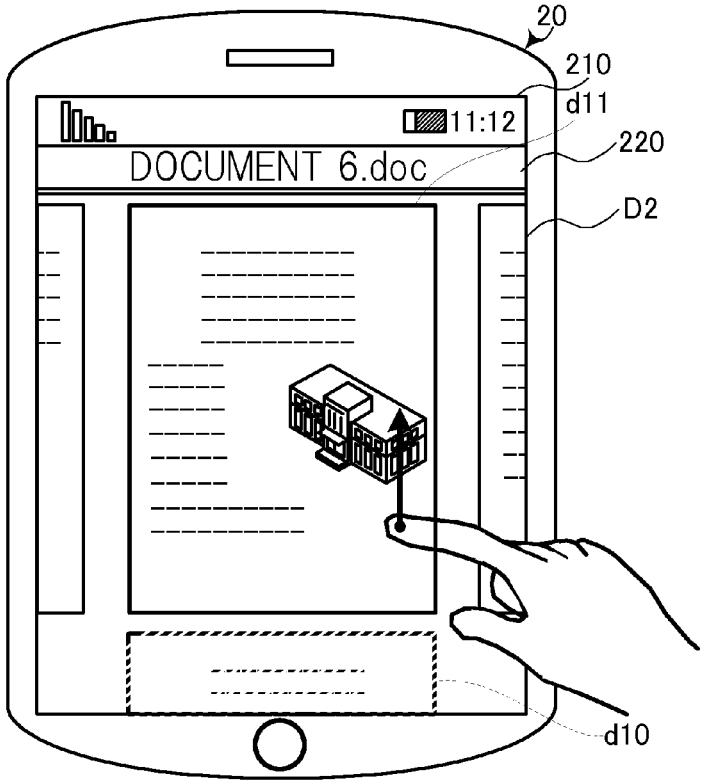


Fig.14B



DISPLAY INPUT APPARATUS AND COMPUTER-READABLE NON-TRANSITORY RECORDING MEDIUM WITH DISPLAY INPUT CONTROL PROGRAM RECORDED THEREON

INCORPORATION BY REFERENCE

This application claims priority to Japanese Patent Application No. 2014-218279 filed on Oct. 27, 2014, the entire disclosure of which are incorporated herein by reference.

BACKGROUND

The present disclosure relates to display input apparatuses and display input control programs and particularly relates to a display input technique in accepting an image formation job based on a user's gesture on a touch panel.

In recent years, techniques have emerged for accepting, based on a user's gesture on a touch panel, an image formation job to be executed by an image forming apparatus. For example, a technique is known for, upon acceptance of a slide gesture, such as a flick gesture or a swipe gesture, in a predetermined direction on an icon representing a candidate piece of data for image formation, accepting an image formation job to allow an image forming apparatus to form an image of the piece of data represented by the icon. This technique enables entry of an image formation job by an intuitive and simple user's gesture.

SUMMARY

A technique improved over the aforementioned technique is proposed as one aspect of the present disclosure.

A display input apparatus according to an aspect of the present disclosure includes a display section, a touch panel, a gesture acceptance section, a display control section, a job generating section, a communication section, and a communication control section.

The display section is configured to display a plurality of candidate images representing candidate pieces of data for image formation.

The touch panel is disposed in front of the display section.

The gesture acceptance section is configured to accept a user's gesture on the touch panel.

The display control section is configured to control a display operation of the display section according to the user's gesture accepted by the gesture acceptance section.

The job generating section is configured to generate an image formation job for an image forming apparatus according to the user's gesture accepted by the gesture acceptance section.

The communication section is configured to be capable of data transfer to and from the image forming apparatus.

The communication control section is configured to control a communication operation of the communication section.

The job generating section is further configured to, when the gesture acceptance section accepts a slide gesture in a predetermined first direction on one of the plurality of candidate images, generate the image formation job to allow the image forming apparatus to perform image formation based on the candidate piece of data for image formation represented by the one candidate image.

The communication control section is further configured to allow the communication section to send the image formation job generated by the job generating section to the image forming apparatus.

The display control section is further configured to, when the gesture acceptance section accepts the slide gesture in the first direction on the one candidate image, allow the display section to display, at an end of a display area of the display section in the first direction, the one candidate image as a pending image indicating a piece of data pending on the image forming apparatus and thereafter, when the communication section receives a report indicating a completion of the image formation job from the image forming apparatus, allow the display section to eliminate the display of the pending image.

A computer-readable non-transitory recording medium according to another aspect of the present disclosure contains a display input control program recorded thereon.

The display input control program allows a computer to function as a gesture acceptance section, a display control section, a job generating section, and a communication control section.

The gesture acceptance section is configured to accept a user's gesture on a touch panel disposed in front of a display section configured to display a plurality of candidate images representing candidate pieces of data for image formation.

The display control section is configured to control a display operation of the display section according to the user's gesture accepted by the gesture acceptance section.

The job generating section is configured to generate an image formation job for an image forming apparatus according to the user's gesture accepted by the gesture acceptance section.

The communication control section is configured to control a communication operation of a communication section capable of data transfer to and from the image forming apparatus.

The display input control program further allows the computer to function so that when the gesture acceptance section accepts a slide gesture in a predetermined first direction on one of the plurality of candidate images, the job generating section generates the image formation job to allow the image forming apparatus to perform image formation based on the candidate piece of data for image formation represented by the one candidate image.

The display input control program further allows the computer to function so that the communication control section allows the communication section to send the image formation job generated by the job generating section to the image forming apparatus.

The display input control program further allows the computer to function so that when the gesture acceptance section accepts the slide gesture in the first direction on the one candidate image, the display control section allows the display section to display, at an end of a display area of the display section in the first direction, the one candidate image as a pending image indicating a piece of data pending on the image forming apparatus and thereafter, when the communication section receives a report indicating a completion of the image formation job from the image forming apparatus, the display control section allows the display section to eliminate the pending image displayed at the end.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view showing the structure of a display input system according to one embodiment of the present disclosure.

FIG. **2** is a block diagram showing the internal configuration of the display input system according to the one embodiment of the present disclosure.

FIG. **3** is a view showing an example of a document folder screen displayed on a display section of a mobile terminal device according to the one embodiment of the present disclosure.

FIG. **4** is a flowchart showing a processing flow of the mobile terminal device according to the one embodiment of the present disclosure.

FIG. **5** is a view showing an example of a number-of-copies acceptance image displayed on the display section of the mobile terminal device according to the one embodiment of the present disclosure.

FIG. **6**A is a view showing an example of a gesture for entering an image formation job on the mobile terminal device according to the one embodiment of the present disclosure.

FIG. **6**B is a view showing an example of a pending icon displayed on the display section of the mobile terminal device according to the one embodiment of the present disclosure.

FIG. **7**A is a view showing how the pending icon is eliminated from the display section of the mobile terminal device according to the one embodiment of the present disclosure.

FIG. **7**B is a view showing an example of a gesture for cancelling an image formation job on the mobile terminal device according to the one embodiment of the present disclosure.

FIG. **8** is a flowchart showing a flow of processing in step S**26** shown in FIG. **4** in the mobile terminal device according to the one embodiment of the present disclosure.

FIG. **9**A is a view showing an example of a file screen displayed on the display section of the mobile terminal device according to the one embodiment of the present disclosure.

FIG. **9**B is a view showing another example of a number-of-copies acceptance image displayed on the display section of the mobile terminal device according to the one embodiment of the present disclosure.

FIG. **10**A is a view showing another example of a gesture for entering an image formation job on the mobile terminal device according to the one embodiment of the present disclosure.

FIG. **10**B is a view showing an example of a pending page image displayed on the display section of the mobile terminal device according to the one embodiment of the present disclosure.

FIG. **11**A is a view showing how the pending page image is eliminated from the display section of the mobile terminal device according to the one embodiment of the present disclosure.

FIG. **11**B is a view showing another example of a gesture for cancelling an image formation job on the mobile terminal device according to the one embodiment of the present disclosure.

FIG. **12**A and FIG. **12**B are flowcharts showing a processing flow of a mobile terminal device according to a modification.

FIG. **13**A is a view showing an example of a gesture for setting a piece of data for a first page on the mobile terminal device according to the modification.

FIG. **13**B is a view showing an example of a first-page image displayed on a display section of the mobile terminal device according to the modification.

FIG. **14**A is a view showing an example of a gesture for cancelling the piece of data for the first page on the mobile terminal device according to the modification.

FIG. **14**B is a view showing an example of a gesture for setting a piece of data for a last page on the mobile terminal device according to the modification.

DETAILED DESCRIPTION

Hereinafter, a description will be given of a display input apparatus and a display input control program, both according to one embodiment of the present disclosure, with reference to the drawings.

FIG. **1** is a perspective view showing the structure of a display input system according to one embodiment of the present disclosure. FIG. **2** is a block diagram showing the internal configuration of the display input system according to the one embodiment of the present disclosure.

A display input system **1** includes an image forming apparatus **10** and a mobile terminal device **20** capable of communicating with the image forming apparatus **10**. The mobile terminal device **20** serves as a display input apparatus which generates an image formation job based on a user's gesture on a touch panel **220** and sends the generated image formation job to the image forming apparatus **10**. First, a description will be given of the structure and configuration of the image forming apparatus **10**.

The image forming apparatus **10** is a multifunction peripheral having multiple functions including, for example, a copy function, a print function, a scan function, and a facsimile function. The image forming apparatus **10** is roughly composed of an apparatus body **11**, an image reading section **110** disposed above the apparatus body **11**, and a connecting portion **12** provided between the image reading section **110** and the apparatus body **11**.

The apparatus body **11** is made up to include an image forming section **120**, a sheet feed section **13**, and so on.

In an image forming operation of the image forming apparatus **10**, the image forming section **120** forms a toner image on a recording paper sheet fed from the sheet feed section **13** based on an image read by the image reading section **110** or other images. Thereafter, the toner image formed on the recording paper sheet is heat fixed by an unshown fixing section. The recording paper sheet having an image fixed thereon by the completion of the fixing is discharged to a sheet output tray **14**.

A display section **130** and an operating section **150** are disposed at the front of a housing forming a shell of the image forming apparatus **10**. The display section **130** is formed to include a liquid crystal display (LCD) or an organic light-emitting diode (OLED) display. The display section **130** is configured to, under the control of a display control section **102** to be described hereinafter, display a setting screen for accepting an image formation job and settings relating to image formation or other screens.

A touch panel **140** is disposed in front of the display section **130**. The touch panel **140** is a touch panel of, for example, a so-called resistive film system or a capacitance system and is configured to detect a user's touch of the touch panel **140** together with the point of touch. When detecting the user's touch, the touch panel **140** outputs a detection signal indicating a coordinate point of the point of touch to a hereinafter described gesture acceptance section **103** and so on.

The operating section **150** is hard keys including, for example, a menu key for calling up a menu, arrow keys for moving the focus of a GUI (graphical user interface) forming the menu, a determination key for performing a determination operation for the GUI forming the menu, and so on.

A storage section **160** is a large storage device, such as an HDD (hard disk drive).

A communication section **170** is a network interface composed of a communication module, such as a wireless LAN board.

The image forming apparatus **10** further includes a control unit **100**. The control unit **100** is composed of a CPU (central processing unit), a RAM (random access memory), a ROM (read only memory), and so on. When a control program stored in the above ROM or the storage section **160** is executed by the above CPU, the control unit **100** functions as a control section **101**, a display control section **102**, a gesture acceptance section **103**, a job generating section **104**, a communication control section **105**, and an authenticating section **106**. Alternatively, each of the control section **101**, the display control section **102**, the gesture acceptance section **103**, the job generating section **104**, the communication control section **105**, and the authenticating section **106** of the control unit **100** may not be implemented by the operation of the control unit **100** in accordance with the control program but may be constituted by a hardware circuit.

The control section **101** governs the overall operation control of the image forming apparatus **10**. The control section **101** is connected to the image reading section **110**, the image forming section **120**, the display section **130**, the touch panel **140**, the operating section **150**, the storage section **160**, the communication section **170**, and so on. The control section **101** performs the operation control of the above components connected thereto and signal or data transfer to and from the components. Particularly, the control section **101** is configured to execute an image formation job generated by the job generating section **104** or an image formation job sent from the mobile terminal device **20** to allow the image forming section **120** or the like to form an image of image data indicated by the image formation job on a recording paper sheet.

The display control section **102** has the function of controlling the display operation of the display section **130**.

The gesture acceptance section **103** has the function of accepting, based on a detection signal output from the touch panel **140**, a user's gesture on the touch panel **140**. Furthermore, the gesture acceptance section **103** also has the function of accepting a user's gesture using the operating section **150**, such as a hardware key.

The job generating section **104** has the function of generating an image formation job for the image forming apparatus **10** according to the user's gesture accepted by the gesture acceptance section **103**.

The setting screen displayed on the display section **130** presents a plurality of setting items for accepting detailed settings relating to image formation, including, for example, the size of recording paper sheet, image quality, page aggregation, and the destination for sheet output. The job generating section **104** can generate, according to a user's gesture on the setting screen, an image formation job in which detailed settings relating to image formation, such as the size of recording paper sheet, image quality, page aggregation, and the destination for sheet output, are made.

The communication control section **105** has the function of controlling the communication section **170** to allow the communication section **170** to transfer data to and from the mobile terminal device **20** and so on.

The authenticating section **106** has the function of determining whether or not the control section **101** executes the image formation job sent from the mobile terminal device **20** by authenticating or not authenticating the mobile terminal device **20** based on an authentication request sent from the mobile terminal device **20**. Thus, it is possible to exclude any image formation job sent from other than one or more particular mobile terminal devices.

Next, a description will be given of the structure and configuration of the mobile terminal device **20**. The mobile terminal device **20** is a mobile device such as a smartphone and includes a control unit **200**, a display section **210**, a touch panel **220**, a storage section **230**, a communication section **240**, and so on.

The display section **210** is formed of a liquid crystal display, an organic light-emitting diode display or the like. The display section **210** is configured to, under the control of a display control section **202** to be described hereinafter, display a document folder screen or other screens.

FIG. **3** is a view showing an example of a document folder screen displayed on the display section **210**. A plurality of icons d**1**, d**2** (candidate images) and so on are arranged on the document folder screen D**1** shown in FIG. **3**. The icons d**1**, d**2** represent files, such as document files, serving as candidate pieces of data for image formation on the image forming apparatus **10**. A job generating section **204** to be described hereinafter is configured to generate an image formation job for the image forming apparatus **10** according to a touch gesture on any of the icons d**1**, d**2**.

The touch panel **220** is disposed in front of the display section **210** and configured to, when detecting a user's touch thereon, output a detection signal indicating a coordinate point of the point of touch to a hereinafter described gesture acceptance section **203** and so on.

The storage section **230** is a large storage device, such as an HDD.

The communication section **240** is a network interface composed of a communication module, such as a wireless LAN chip.

The control unit **200** is composed of a CPU, a RAM, a ROM, and so on. When a display input control program stored in the above ROM or the storage section **230** is executed by the above CPU, the control unit **200** functions as a control section **201**, a display control section **202**, a gesture acceptance section **203**, a job generating section **204**, and a communication control section **205**. Alternatively, each of the control section **201**, the display control section **202**, the gesture acceptance section **203**, the job generating section **204**, and the communication control section **205** of the control unit **200** may not be implemented by the operation of the control unit **200** in accordance with the display input control program but may be constituted by a hardware circuit.

The control section **201** governs the overall operation control of the mobile terminal device **20**. The control section **201** is connected to the display section **210**, the touch panel **220**, the storage section **230**, the communication section **240**, and so on. The control section **201** performs the operation control of the above components connected thereto and signal or data transfer to and from the components.

The display control section **202** has the function of controlling the display operation of the display section **210**.

The gesture acceptance section **203** has the function of accepting, based on a detection signal output from the touch panel **220**, a user's gesture on the touch panel **220**.

The term user's gesture herein includes: a slide gesture, such as a flick gesture and a swipe gesture; a tap gesture; and a pinch gesture. For example, when the user slides his/her finger on the touch panel **220** while keeping it in touch with the touch panel **220**, the touch panel **220** outputs to the

gesture acceptance section **203** detection signals indicating a series of points of movement from an initial point at which the touch has been first detected to a last point at which the touch is last detected. Based on the detection signals output from the touch panel **220**, the gesture acceptance section **203** identifies the user's gesture input by the user as a slide gesture. Then, the gesture acceptance section **203** outputs a control signal corresponding to the slide gesture to the display control section **202**, the job generating section **204**, and so on.

The job generating section **204** has the function of generating an image formation job for the image forming apparatus **10** according to the user's gesture, such as a slide gesture, accepted by the gesture acceptance section **203**.

As will hereinafter be described in detail, the image formation job generated by the job generating section **204** is, unlike an image formation job generated on the image forming apparatus **10** and containing detailed settings relating to image formation, such as page aggregation, the size of recording paper sheet, image quality, and the destination for sheet output, an image formation job in which only simple settings, such as the specification of a candidate piece of data for image formation and the number of copies to be made, are made. The job generating section **204** generates the image formation job based on an intuitive and simple user's gesture, such as a slide gesture, on an icon displayed on the display section **210**.

The communication control section **205** has the function of controlling the communication section **240** to allow the communication section **240** to transfer data to and from the image forming apparatus **10**. Particularly, the communication control section **205** allows the communication section **240** to send the image formation job generated by the job generating section **204** to the image forming apparatus **10**.

Next, a description will be given of the operation of the mobile terminal device **20** which have the above-described configuration. FIG. **4** is a flowchart showing a processing flow of the mobile terminal device **20**.

When the gesture acceptance section **203** accepts an instruction to display a document folder screen based on a user's gesture on the touch panel **220** (YES in step S**10**), the display control section **202** allows the display section **210** to display the document folder screen (step S**11**).

When after the display of the document folder screen the gesture acceptance section **203** accepts a double-tap gesture on any icon presented on the document folder screen (YES in step S**12**), the mobile terminal device **20** executes processing in step S**26**. The term double-tap gesture herein refers to a gesture of tapping twice at the same position within a predetermined period of time. As will hereinafter be described in detail, in the processing in step S**26**, the display control section **202** allows the display section **210** to display a plurality of page images indicating pieces of page data contained in a file represented by the double-tapped icon (see FIG. **9**A and so on) and the job generating section **204** generates an image formation job based on a user's gesture, such as a slide gesture, on any of the page images.

On the other hand, if the gesture acceptance section **203** has not accepted any double-tap gesture on any icon presented on the document folder screen (NO in step S**12**), the gesture acceptance section **203** determines whether or not a long-tap gesture has been made on any icon presented on the document folder screen (step S**13**). The term long-tap gesture herein refers to a tap gesture held at the same position over a predetermined period of time or longer.

When a long-tap gesture is made on any icon presented on the document folder screen (YES in step S**13**), the display control section **202** allows the display section **210** to display a predetermined number-of-copies acceptance image (step S**14**). The number-of-copies acceptance image is an image for accepting the number of copies to be made from a candidate piece of data for image formation represented by the long-tapped icon. FIG. **5** is a view showing an example of a number-of-copies acceptance image displayed on the display section **210**. In the example shown in FIG. **5**, a long-tap gesture on the icon d**2** is made as a gesture for setting the number of copies to be made. In this case, the display control section **202** allows the display section **210** to display a number-of-copies acceptance image d**3** near or on top of the icon d**2**. When making a tap gesture on the number-of-copies acceptance image d**3** to increase or decrease the number of copies to be made, the user can set a desired number of copies.

After the display of the number-of-copies acceptance image, the gesture acceptance section **203** accepts the setting of the number of copies based on the tap gesture made on the number-of-copies acceptance image d**3** (step S**15**).

On the other hand, if no long-tap gesture has been made on any icon presented on the document folder screen (NO in step S**13**), the pieces of processing in steps S**14** and S**15** are not performed.

Thereafter, the gesture acceptance section **203** determines whether or not a slide gesture in an upward direction, which is a predetermined first direction, has been made on any icon presented on the document folder screen (step S**16**).

When the gesture acceptance section **203** accepts an upward slide gesture on any icon (YES in step S**16**), the display control section **202** allows the display section **210** to display, at a top end of a display area of the display section **210**, the slid icon as a pending icon (pending image) indicating a piece of data pending on the image forming apparatus **10** (step S**17**). In the example shown in FIG. **6**A, an upward slide gesture on the icon d**2** of the plurality of icons arranged on the document folder screen D**1** is made as a gesture for entering an image formation job. In this case, as shown in FIG. **6**B, the display control section **202** allows the display section **210** to display a pending icon d**4** formed of a semi-transparent lower portion of the icon d**2** at the top end of the display area of the display section **210**.

After the piece of processing in step S**17**, the job generating section **204** generates an image formation job to allow the image forming apparatus **10** to perform image formation based on a file represented by the icon on which the gesture acceptance section **203** has accepted the slide gesture in the piece of processing in step S**16** (step S**18**). The job generating section **204** allows the storage section **230** to store the generated image formation job.

If in the piece of processing in step S**13** the gesture acceptance section **203** has not accepted any long-tap gesture on any icon, the job generating section **204**, in a piece of processing in step S**18**, generates an image formation job specifying the file as a candidate piece of data for image formation.

On the other hand, when the gesture acceptance section **203** accepts a long-tap gesture on any icon in the piece of processing in step S**13** and then accepts the setting of the number of copies in the piece of processing in step S**15**, the job generating section **204**, in the piece of processing in step S**18**, generates an image formation job specifying not only the file as a candidate piece of data for image formation but also the number of copies set in the piece of processing in step S**15**.

After the piece of processing in step S**18**, the communication control section **205** allows the communication section

240 to send the image formation job generated by the job generating section 204 to the image forming apparatus 10 (step S19).

Although not given in the flowchart shown in FIG. 4, the communication control section 205 allows the communication section 240 to send, prior to the piece of processing in step S19, to the image forming apparatus 10 an authentication request containing a password and so on for use in authenticating the mobile terminal device 20 in the image forming apparatus 10. In the image forming apparatus 10, the authenticating section 106 determines whether or not the control section 101 executes the image formation job sent from the mobile terminal device 20 by authenticating or not authenticating the mobile terminal device 20 based on the authentication request. When the authenticating section 106 succeeds in authenticating the mobile terminal device 20, the communication control section 105 allows the communication section 170 to send a notification signal indicating a successful authentication to the mobile terminal device 20. The piece of processing in step S19 is performed after the mobile terminal device 20 receives the notification signal indicating the successful authentication.

By making an upward slide gesture on a desired file as if launching out an image formation job from the mobile terminal device 20 toward the image forming apparatus 10 through the pieces of processing in steps 16 to 19, the user can enter into the image forming apparatus 10 the image formation job to allow the file to be subjected to image formation. Therefore, the mobile terminal device 20 according to the one embodiment of the present disclosure can provide an operating method for entering an image formation job giving the user an intuitive and novel operating feeling.

After the sending of the image formation job, the gesture acceptance section 203 determines whether or not a slide gesture in a downward direction (second direction), which is a direction opposite to the predetermined first direction, has been made on the pending icon (step S20).

When the gesture acceptance section 203 accepts a downward slide gesture on the pending icon (YES in step S20), the display control section 202 allows the display section 210 to eliminate the display of the pending icon (step S21).

Then, the job generating section 204 generates a cancel instruction to cancel the image formation job sent in the piece of processing in step S19 (step S22).

After the piece of processing in step S22, the communication control section 205 allows the communication section 240 to send the cancel instruction generated by the job generating section 204 to the image forming apparatus 10 (step S23). In the example shown in FIG. 7B, a downward slide gesture on the pending icon d4 displayed at the top end of the display area of the display section 210 is made as a gesture for cancelling an image formation job. In this case, the job generating section 204 generates a cancel instruction to cancel an image formation job for the file "Document 6.doc" represented by the pending icon d4.

On the other hand, if the gesture acceptance section 203 has not accepted any downward slide gesture on any pending icon (NO in step S20), the display control section 202 stands by until a report notifying of the completion of the image formation job sent in the piece of processing in step S19 is sent from the image forming apparatus 10 and the communication section 240 receives the report (step S24). Then, when the communication section 240 receives the report notifying of the completion of the image formation job (YES in step S24), the display control section 202 allows the display section 210 to eliminate the display of the pending icon (step S25). In doing so, the display control section 202 allows the display section 210 to eliminate the display of the pending icon by moving up the pending icon displayed at the top end of the display area of the display section 210 to the outside of the display area. In the example shown in FIG. 7A, as a result of completion of the image formation job for the file "Document 6.doc" on the image forming apparatus 10, the pending icon d4 is moved out of the display area of the display section 210 (see the arrow in the figure).

In this relation, in the previously described technique for, upon acceptance of a slide gesture in a predetermined direction on an icon representing a candidate piece of data for image formation, accepting an image formation job to allow an image forming apparatus to form an image of the piece of data represented by the icon, the user cannot easily know whether or not the slide gesture in the predetermined direction for entering the image formation job has been correctly recognized and the image formation job has been accepted by the image forming apparatus. For example, if a number of image formation jobs are concentrated in the image forming apparatus, it takes long time for each image formation job to be executed after the acceptance thereof. In such a case, in the above technique previously described, since the user cannot know whether or not the image formation job has been accepted by the image forming apparatus, the user may erroneously assume that a slide gesture in the predetermined direction has not correctly been made. As a result of this erroneous assumption, the user may repeat the slide gesture in the predetermined direction a plurality of times, so that a plurality of identical image formation jobs may be entered into the image forming apparatus.

Unlike the above, in the above pieces of processing in steps S20 to S25, the display control section 202 allows the display section 210 to keep on displaying a pending icon until an image formation job is executed by the image forming apparatus 10 since the sending of the image formation job, i.e., while the image formation job is pending on the image forming apparatus 10. By making an upward slide gesture for entering an image formation job and then confirming the presence of a pending icon displayed at a top end of the display area of the display section 210, the user can know that the upward slide gesture has been correctly recognized by the mobile terminal device 20 and the image formation job has been sent to the image forming apparatus 10. Furthermore, as long as the pending icon is displayed on the display section 210, the user can know that the image formation job is pending on the image forming apparatus 10. Thus, even if a number of image formation jobs are concentrated in the image forming apparatus 10, so that it takes long time for each image formation job to be executed after the upward slide gesture for entering the image formation job, the user can be prevented from erroneously assuming that the upward slide gesture has not been recognized by the mobile terminal device 20. Therefore, the mobile terminal device 20 according to the one embodiment of the present disclosure can avoid that the user repeats an upward slide gesture on an icon a plurality of times, resulting in entry of a plurality of identical image formation jobs into the image forming apparatus 10.

In addition, by making a downward slide gesture on a pending icon displayed at the top end of the display area of the display section 210 as if withdrawing an image formation job from the image forming apparatus 10 to the mobile terminal device 20, the user can enter into the image forming apparatus 10 an instruction to cancel the image formation

job. Therefore, the mobile terminal device **20** according to the one embodiment of the present disclosure can provide an operating method for entering an instruction to cancel an image formation job giving the user an intuitive and novel operating feeling.

Next, a description will be given of the detailed contests of the previously described processing in step S**26**. FIG. **8** is a flowchart showing a flow of processing in step S**26** in the mobile terminal device **20**.

The display control section **202** allows the display section **210** to display a predetermined file screen (step S**30**). The file screen presents a plurality of page images (candidate images) indicating pieces of page data which are contained in the file selected in the piece of processing in step S**12** and serving as candidate pieces of data for image formation. FIG. **9**A is a view showing an example of a file screen displayed on the display section **210**. The file screen D**2** shown in FIG. **9**A presents page images d**5**, d**6**, d**7** representing pieces of page data contained in the file "Document 6.doc".

When the gesture acceptance section **203** accepts a lateral slide gesture on a page image in the file screen (YES in step S**31**), the display control section **202** allows the display section **210** to change the page image being displayed (step S**32**). In the example shown in FIG. **9**A, a leftward slide gesture on the page image d**6** is made as a gesture for changing the page image. In this case, the display control section **202** allows the display section **210** to change the page image being displayed to the page image d**7** following the page image d**6**. On the other hand, when the user makes a rightward slide gesture on the page image d**6**, the display control section **202** allows the display section **210** to change the page image being displayed to the page image d**5** preceding the page image d**6**.

Furthermore, when the gesture acceptance section **203** accepts a long-tap gesture on any page image in the file screen (YES in step S**33**), the display control section **202**, like the piece of processing in step S**14**, allows the display section **210** to display a predetermined number-of-copies acceptance image (step S**34**). In the example shown in FIG. **9**B, a long-tap gesture on the page image d**6** is made as a gesture for setting the number of copies to be made. In this case, the display control section **202** allows the display section **210** to display a number-of-copies acceptance image d**8** near or on top of the page image d**6**. After the display of the number-of-copies acceptance image, the gesture acceptance section **203** accepts the setting of the number of copies based on the tap gesture made on the number-of-copies acceptance image d**8** (step S**35**).

Next, when the gesture acceptance section **203** accepts an upward slide gesture on any page image in the file screen (YES in step S**36**), the display control section **202** allows the display section **210** to display, at a top end of the display area of the display section **210**, the slid page image as a pending page image (pending image) indicating a piece of data pending on the image forming apparatus **10** (step S**37**). In the example shown in FIG. **10**A, an upward slide gesture on the page image d**6** of the plurality of page images arranged on the file screen D**2** is made as a gesture for entering an image formation job. In this case, as shown in FIG. **10**B, the display control section **202** allows the display section **210** to display a pending page image d**9** formed of a semi-transparent lower portion of the page image d**6** at the top end of the display area of the display section **210**. Furthermore, the display control section **202** allows the display section **210** to change the page image being displayed to the page image d**7** following the page image d**6**.

After the piece of processing in step S**37**, the job generating section **204** generates an image formation job to allow the image forming apparatus **10** to perform image formation based on a piece of page data represented by the page image on which the gesture acceptance section **203** has accepted the slide gesture in the piece of processing in step S**36** (step S**38**). Then, the communication control section **205** allows the communication section **240** to send the image formation job generated by the job generating section **204** to the image forming apparatus **10** (step S**39**).

When after the sending of the image formation job the gesture acceptance section **203** accepts a downward slide gesture on the pending page image (YES in step S**40**), the display control section **202** allows the display section **210** to eliminate the display of the pending page image (step S**41**).

Then, the job generating section **204** generates a cancel instruction to cancel the image formation job sent in the piece of processing in step S**39** (step S**42**). Furthermore, the communication control section **205** allows the communication section **240** to send the cancel instruction generated by the job generating section **204** to the image forming apparatus **10** (step S**43**). In the example shown in FIG. **11**B, a downward slide gesture on the pending page image d**9** displayed at the top end of the display area of the display section **210** is made as a gesture for cancelling an image formation job. In this case, the job generating section **204** generates a cancel instruction to cancel an image formation job for a piece of page data represented by the pending page image d**9**.

On the other hand, if the gesture acceptance section **203** has not accepted any downward slide gesture on any pending page image (NO in step S**40**), the display control section **202** stands by until a report notifying of the completion of the image formation job sent in the piece of processing in step S**39** is sent from the image forming apparatus **10** and the communication section **240** receives the report (step S**44**). Then, when the communication section **240** receives the report notifying of the completion of the image formation job (YES in step S**44**), the display control section **202** allows the display section **210** to eliminate the display of the pending page image (step S**45**). In doing so, the display control section **202** allows the display section **210** to eliminate the display of the pending page image by moving up the pending page image displayed at the top end of the display area of the display section **210** to the outside of the display area. In the example shown in FIG. **11**A, as a result of completion of the image formation job on the image forming apparatus **10**, the pending page image d**9** is moved out of the display area of the display section **210** (see the arrow in the figure).

By, as just described, performing, also on a page image representing a piece of page data as a candidate piece of data for image formation, the same gesture as made on an icon representing a file as a candidate piece of data for image formation, the user can enter an image formation job for the image forming apparatus **10**.

The present disclosure is not limited to the configuration of the above embodiment and can be modified in various ways.

FIG. **12**A and FIG. **12**B are flowcharts showing a flow of processing in step **26** in a mobile terminal device **20** according to a modification. The same pieces of processing as those in the flowchart of FIG. **8** are designated by the same references and further explanation thereof will be omitted.

When the gesture acceptance section **203** accepts a slide gesture in a downward direction (second direction) opposite to the predetermined first direction on a page image in a file

screen (step S50), the display control section **202** allows the display section **210** to display the slid page image as a first-page image representing a piece of data of a first page for image formation at a bottom end of the display area of the display section **210** (step S51). In the example shown in FIG. **13**A, a downward slide gesture on the page image d**6** of the plurality of page images arranged on the file screen D**2** is made as a gesture for specifying a piece of data of a first page. In this case, as shown in FIG. **13**B, the display control section **202** allows the display section **210** to display a first-page image d**10** formed of a semi-transparent upper portion of the page image d**6** at the bottom end of the display area of the display section **210**. Furthermore, the display control section **202** allows the display section **210** to change the page image being displayed to the page image d**7** following the page image d**6**.

The gesture acceptance section **203** accepts, as a piece of data of a first page for image formation, a piece of page data represented by the page image on which the downward slide gesture has been made (step S52). The gesture acceptance section **203** allows the storage section **230** to store the accepted piece of data of the first page.

When, as shown in FIG. **14**A, an upward slide gesture on the first-page image d**10** is made as a gesture for cancelling the piece of data of the first page, the display control section **202** allows the display section **210** to eliminate the display of the first-page image d**10**. Then, the gesture acceptance section **203** allows the storage section **230** to delete the piece of page data accepted as a piece of data of a first page in the piece of processing in step S52.

When, after the piece of processing in step S52, the gesture acceptance section **203** accepts an upward slide gesture on a page image (YES in step S53), the display control section **202** allows the display section **210** to display, at a top end of the display area of the display section **210**, the slid page image as a pending page image indicating a piece of data pending on the image forming apparatus **10** (step S54).

Then, the gesture acceptance section **203** accepts, as a piece of data of a last page for image formation, a piece of page data represented by the page image on which the upward slide gesture has been made (step S55). The gesture acceptance section **203** allows the storage section **230** to store the accepted piece of data of the last page.

After the piece of processing in step S55, the job generating section **204** generates an image formation job to allow the image forming apparatus **10** to perform image formation based on pieces of page data from that of the first page to that of the last page accepted by the gesture acceptance section **203** in the pieces of processing in steps S52 and S55 and stored in the storage section **230** (step S56). When, as shown in FIG. **14**B, an upward slide gesture on a page image d**11** of the plurality of page images arranged on the file screen D**2** is made as a gesture for specifying a piece of data of a last page, the job generating section **204** generates an image formation job to allow the image forming apparatus **10** to perform image formation based on pieces of page data from that represented by the first-page image d**10** to that represented by the page image d**11**.

In the mobile terminal device **20** according to the modification, as just described, the user can enter an image formation job specifying pieces of page data on the first and last pages for image formation by intuitive and simple user's gestures formed of downward and upward slide gestures on desired page images.

Although in the above embodiment and modification the mobile terminal device has been taken as an example of the display input apparatus, the present disclosure is not necessarily limited to this. The display input apparatus applicable as one embodiment of the present disclosure may be, besides the mobile terminal device, for example, an image forming apparatus, a personal computer or a television set.

The display input control program described in the above embodiment and modification may be one stored on a computer-readable non-transitory recording medium, such as a hard disk, a CD-ROM, a DVD-ROM or a semiconductor memory.

Various modifications and alterations of this disclosure will be apparent to those skilled in the art without departing from the scope and spirit of this disclosure, and it should be understood that this disclosure is not limited to the illustrative embodiments set forth herein.

What is claimed is:

1. A display input apparatus comprising:

a display section configured to display a plurality of candidate images representing candidate pieces of data for image formation on an image forming apparatus;

a touch panel disposed in front of the display section;

a gesture acceptance section configured to accept a user's gesture on the touch panel;

a display control section configured to control a display operation of the display section according to the user's gesture accepted by the gesture acceptance section;

a job generating section configured to generate an image formation job for the image forming apparatus according to the user's gesture accepted by the gesture acceptance section;

a communication section capable of data transfer to and from the image forming apparatus; and

a communication control section configured to control a communication operation of the communication section,

wherein the job generating section is further configured to, when the gesture acceptance section accepts a slide gesture in a predetermined first direction on one of the plurality of candidate images, generate the image formation job to allow the image forming apparatus to perform image formation based on the candidate piece of data for image formation represented by the one candidate image,

the communication control section is further configured to allow the communication section to send the image formation job generated by the job generating section to the image forming apparatus, and

the display control section is further configured to, when the gesture acceptance section accepts the slide gesture in the first direction on the one candidate image, allow the display section; to display, at an end of the display area of the display section in the first direction, the one candidate image as a pending image indicating a piece of data pending on the image forming apparatus; and to continue the state of displaying the one candidate image at an end of a display area in the first direction until the communication section receives from the image forming apparatus a report indicating a completion of the image formation job, and when the communication section receives a report indicating a completion of the image formation job from the image forming apparatus, allow the display section to release the state of displaying and to eliminate the display of the pending image.

2. The display input apparatus according to claim 1, wherein

when the gesture acceptance section accepts a slide gesture in a second direction opposite to the first direction on the pending image after accepting the slide gesture in the first direction on the one candidate image and before the communication section receives the report indicating the completion of the image formation job, the job generating section generates a cancel instruction to cancel the image formation job, and

the communication control section allows the communication section to send the cancel instruction generated by the job generating section to the image forming apparatus.

3. The display input apparatus according to claim 1, wherein the display control section is further configured to allow the display section to eliminate the display of the pending image by moving the pending image in the first direction to the outside of the display area.

4. The display input apparatus according to claim 1, wherein

when the gesture acceptance section accepts a tap gesture held on the one candidate image over a predetermined period of time or longer, the display control section allows the display section to display a number-of-copies acceptance image for accepting a number of copies to be made from the candidate piece of data for image formation represented by the one candidate image, and

the job generating section generates an image formation job to allow the image forming apparatus to perform the image formation by the number of copies set according to a user's gesture on the number-of-copies acceptance image.

5. The display input apparatus according to claim 1, wherein the display control section is further configured to allow the display section to display as the candidate image an icon representing a file as the candidate piece of data for image formation.

6. The display input apparatus according to claim 1, wherein the display control section is further configured to allow the display section to display as the candidate image a page image representing a piece of page data as the candidate piece of data for image formation.

7. The display input apparatus according to claim 1, wherein the display control section is further configured to allow the display section to display as the candidate image an icon representing a file as the candidate piece of data for image formation and, when the gesture acceptance section accepts a predetermined gesture on the icon, allow the display section to display as the candidate image a page image representing a piece of page data as the candidate piece of data for image formation.

8. The display input apparatus according to claim 1, wherein the display control section is further configured to, when the gesture acceptance section accepts the slide gesture in the first direction on the one candidate image, allow the display section to display, at the end of the display area of the display section in the first direction, the one semi-transparentized candidate image as the pending image.

9. The display input apparatus according to claim 6, wherein

when the gesture acceptance section accepts a slide gesture in a second direction opposite to the first direction on one of the plurality of page images, the display control section allows the display section to display, at an end of the display area of the display section in the second direction, the one page image as a first-page image representing a piece of data of a first page for image formation, and

the job generating section generates, when the gesture acceptance section accepts the slide gesture in the first direction on the page image different from the one page image in the state of displaying the one page image at the end of the display area of the display section in the second direction after the gesture acceptance section accepts the slide gesture in the second direction on the one page image of the plurality of page images an image formation job to allow the image forming apparatus to perform image formation in which the piece of page data represented by the first-page image is the piece of data of the first page for image formation and in which the piece of page data represented by the different page image is a piece of page data of a last page for image formation.

10. The display input apparatus according to claim 9, wherein the display control section is further configured to allow the display section to continue the state of displaying the one page image at the end of the display area in the second direction until the gesture acceptance section accepts the slide gesture in the first direction on the page image different from the one page image after the gesture acceptance section accepts the slide gesture in the second direction on the one page image of the plurality of page images.

11. A computer-readable non-transitory recording medium with a display input control program recorded thereon, the display input control program allowing a computer to function as:

a gesture acceptance section configured to accept a user's gesture on a touch panel disposed in front of a display section configured to display a plurality of candidate images representing candidate pieces of data for image formation on an image forming apparatus;

a display control section configured to control a display operation of the display section according to the user's gesture accepted by the gesture acceptance section;

a job generating section configured to generate an image formation job for the image forming apparatus according to the user's gesture accepted by the gesture acceptance section; and

a communication control section configured to control a communication operation of a communication section capable of data transfer to and from the image forming apparatus,

the display input control program further allowing the computer to function so that:

when the gesture acceptance section accepts a slide gesture in a predetermined first direction on one of the plurality of candidate images, the job generating section generates the image formation job to allow the image forming apparatus to perform image formation based on the candidate piece of data for image formation represented by the one candidate image;

the communication control section allows the communication section to send the image formation job generated by the job generating section to the image forming apparatus;

when the gesture acceptance section accepts the slide gesture in the first direction on the one candidate image, the display control section allows the display section: to display, at an end of a display area of the display section in the first direction, the one candidate image as a pending image indicating a piece of data pending on the image forming apparatus; and to continue the state of

displaying the one candidate image at an end of a display area in the first direction until the communication section receives from the image forming apparatus a report indicating a completion of the image formation job; and

when the communication section the receives a report indicating a completion of the image formation job from the image forming apparatus, the display control section allows the display section to release the state of displaying and to eliminate the pending image displayed at the end.

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